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ABSTRACT

This is the first comprehensive study to examine Advanced Placement (AP) course-taking patterns and subject test results in the nation's urban schools. This study investigates both Great City Schools' (GCS) AP scores and scores for a national sample of test takers. The GCS data set includes 58 large urban public school districts. The primary purpose of this research, done in collaboration with The College Board, is to examine urban student achievement in the context of high standards. The report analyzes AP examination data on: (1) number of test-takers; (2) race/ethnicity and gender; (3) percentage of test-takers with core or more academic preparation; (4) mean scores on 12 subject tests; (5) mean scores by academic preparation and gender; (6) mean scores of African Americans, Asian Americans, Hispanic Americans, and Whites; (7) scores by household income; and (8) achievement gaps by academic preparation, gender, race/ethnicity, and household income. Data analysis examined biology, calculus AB, chemistry, English language, English literature, physics B, and U.S. history. GCS and national test-takers were more likely to be White than nonWhite. Females were more likely to take exams in subjects requiring extensive reading. Males were more likely to take exams in subjects requiring extensive mathematical skills. Mean subject test scores for GCS test takers were more likely to be below the 3.0 needed for college credit than test takers nationally, whose mean scores were slightly above 3.0. White students were most likely to outperform all other students. Mean AP subject test score differences were greater between Whites and African Americans than between Whites and Hispanics. Most test-takers had core or more academic preparation. Students with such preparation outperformed those with less preparation, though White students in GCS and nationally with less than core preparation scored better in all subjects than Hispanics and African Americans who took core courses. Household income affected AP subject test performance. Document includes 4 tables and 73 figures. Appendices include: (1) Description of Advanced

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Placement Subject Tests; (2) Advanced Placement Examination Scoring Levels and College Credit; (3) Definition of "Core" and "Less than Core" Academic Preparation; and (4) Great City School Districts. (SM)

ADVANCING EXCELLENCE IN URBAN SCHOOLS

A REPORT ON ADVANCED PLACEMENT EXAMINATIONS IN THE GREAT CITY SCHOOLS



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**ADVANCING EXCELLENCE IN URBAN SCHOOLS:
A REPORT ON ADVANCED PLACEMENT EXAMINATIONS
IN THE GREAT CITY SCHOOLS**

COUNCIL OF THE GREAT CITY SCHOOLS

AND

THE COLLEGE BOARD

MARCH 2001

Advancing Excellence in Urban Schools

The Council of the Great City Schools and The College Board thank the following individuals for their contributions to this report:

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Staff from The College Board produced computer-generated statistical reports of AP subject test results. In addition, The College Board provided technical assistance in interpreting the statistical reports.

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EXECUTIVE SUMMARY

Advancing Excellence in Urban Schools: A Report on Advanced Placement Examinations in the Great City Schools is the first comprehensive study to examine Advanced Placement course-taking patterns and subject test results in the nation's urban schools. Advanced Placement (AP) subject tests continue to play a pivotal role in college admissions decisions and placement into college-level courses. The Council of the Great City Schools (CGCS) collaborated with The College Board to conduct this study.¹ Both the Council and The College Board felt that these data would provide meaningful information about the performance of high school students and the extent to which they are engaged in the most challenging courses available.

The Council's primary purpose for initiating this research was to provide urban educators, and those interested in urban education, with a way to examine student achievement in the context of high standards. This report also allows urban school districts to compare their AP exam scores with a sample of students from other urban districts facing similar challenges.

Advancing Excellence in Urban Schools examines both Great City Schools (GCS) AP scores and AP scores for a national sample of test-takers. The GCS data set was compiled on 58 large urban public school districts that were members of the Council of the Great City Schools at the time the data was collected (1998-1999 school year).² The report provides AP test scores for Council districts in the aggregate only; individual district scores are not reported because AP exams were not designed to measure school district performance.

AP subject area courses are offered in participating high schools to prepare students for AP exams. The College Board provides AP Course Description booklets for each discipline that outlines course content, describes curricular goals for each subject, and gives sample examination questions (See Appendix A). While AP courses are strongly recommended to prepare students for AP exams, they are not mandatory.

This report analyzes AP examination data using the following categories and variables:

- Number of test-takers
- Race/ethnicity and gender of test-takers
- Percentage of test-takers with core or more academic preparation
- Mean scores on 12 subject tests
- Mean scores by academic preparation
- Mean scores by gender
- Mean scores of African American, Asian American, Hispanic, and White test-takers
- Mean scores by household income
- Achievement gaps by academic preparation
- Achievement gaps by gender
- Achievement gaps by race/ethnicity
- Achievement gaps by household income

¹The College Board conducted computer-generated statistical analyses of the AP subject tests and CGCS took primary responsibility for analyzing the findings and writing the report.

²See Appendix D for the names of school districts included in the sample.

Advancing Excellence in Urban Schools

The College Board currently offers Advanced Placement courses and exams in 33 subjects. *Advancing Excellence in Urban Schools* includes demographic data and mean score statistics on 12 AP subject tests:

<i>Biology</i>	<i>English Language</i>
<i>Calculus AB</i>	<i>English Literature</i>
<i>Calculus BC</i>	<i>Physics B</i>
<i>Chemistry</i>	<i>Physics C (Electricity & Magnetism)</i>
<i>Computer Science AB</i>	<i>Physics C (Mechanics)</i>
<i>Computer Science A</i>	<i>US History</i>

In addition to demographic descriptions and mean statistics on the 12 AP subject tests, a detailed analysis is provided on the seven most commonly assessed subjects. Data on the following subject tests are disaggregated by race/ethnicity, gender, academic preparation, and household income:

<i>Biology</i>	<i>English Literature</i>
<i>Calculus AB</i>	<i>Physics B</i>
<i>Chemistry</i>	<i>US History</i>
<i>English Language</i>	

The following are key findings from this research:

- ⇒ Approximately a half million AP subject tests were administered during the 1998-99 school year on 12 AP subject exams. Test-takers in both the GCS and nationally were more likely to be White than non-White.
- ⇒ Females were more likely to take exams in subjects that required extensive reading: English Language, English Literature, and US History. Males were more likely to take exams in subjects that required extensive mathematical skills: Physics, Computer Science, and Calculus.
- ⇒ Mean AP subject test scores for GCS test takers were more likely to be below the 3.0 needed to earn college credit. Mean AP subject test scores for test takers nationally were slightly above 3.0.
- ⇒ White students were more likely to outperform all other students. White students in the national sample had higher AP subject test scores than their White counterparts in the GCS. African American students in the GCS scored lower than all other students.
- ⇒ Mean AP subject test score differences were greater between White and African American students than between White and Hispanic students.
- ⇒ The majority of all test-takers had core or more academic preparation. The percentage of urban test-takers with core or more academic preparation was greater than the national sample for six out of the seven subject tests examined.
- ⇒ Students with core or more academic preparation continue to outperform those with less academic preparation. Nationally, students with core or more academic preparation attained higher AP subject test scores than GCS students with core or more academic preparation.

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- ⇒ White students in the GCS and nationally with less than core preparation scored better in all subjects than Hispanic and African Americans who took core courses.
- ⇒ Mean AP subject test scores for GCS students with core or more academic preparation were below the 3.0 needed to earn college credit. Mean AP subject test scores for test takers nationally with core or more academic preparation were slightly above 3.0.
- ⇒ Household incomes continue to affect performance on the AP subject tests. Test-takers with household incomes of \$100,000 or more score higher on AP subject tests than all other students. Students nationally outscore their GCS counterparts at each household income bracket.
- ⇒ The only GCS students who had average scores of 3.0 or above in any AP subject were those with household incomes above \$80,000.

I. INTRODUCTION AND DATA ANALYSIS

Advancing Excellence in Urban Schools: A Report on Advanced Placement Examinations in the Great City Schools examines data on Advanced Placement courses and exam scores in the nation's urban schools. The Council of the Great City Schools (CGCS), in collaboration with The College Board, conducted this study on the number of students participating in Advanced Placement subject tests and their mean scores on those tests.

The results are compiled on 58 urban districts that were members of CGCS in the 1998-1999 school year (see Appendix E for a complete list of participating districts). All data are reported for Great City Schools (GCS) test-takers and the national sample. The study provides demographic data and mean test scores on 12 AP subject tests. Greater detail are provided on the seven most commonly assessed subject tests in the GCS. Overall, *Advancing Excellence in Urban Schools* examines the following data:

- Number of test-takers
- Race/ethnicity and gender of test-takers
- Percentage of test-takers with core or more academic preparation
- Mean scores on 12 subject tests
- Mean scores by academic preparation
- Mean scores by gender
- Mean scores of African American, Asian American, Hispanic, and White test-takers
- Mean scores by household income
- Achievement gaps by academic preparation
- Achievement gaps by gender
- Achievement gaps by race/ethnicity
- Achievement gaps by household income

Advanced Placement examinations are scored on a scale from 1 to 5. According to the American Council on Education (ACE), most colleges and universities require a score of 3 or higher to receive college credit for AP coursework. Appendix B provides a more detailed explanation of scoring levels and descriptions of college credit.

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II. CHARACTERISTICS OF GCS AND NATIONAL AP TEST-TAKERS

- GCS districts administered approximately 38,000 exams in 12 AP subject areas, or approximately 8.5% of the total number (450,000) of AP tests given nationally. (*Table 1*)
- More GCS students took the English Literature exam than any other AP test (14,719); while the Computer Science AB exam was the least frequently administered in the GCS (288). These two exams are also the most and least frequently administered AP exams nationwide. (*Table 1*)
- White students in both the GCS and the nation were more likely to take AP exams than any other ethnic group. (*Figures 1-4*)
- African American students in the GCS were more likely to take AP exams in English Language, Biology and English Literature; they were least likely to take Calculus BC and Physics C (Electricity & Magnetism) exams. (*Figures 1 and 2*)
- Hispanic students in the GCS were most likely to take English Literature, Calculus AB, and Physics B exams; they were least likely to take Calculus BC and Computer Science A tests. (*Figures 1 and 2*)
- Asian American students in the GCS were most likely to take Calculus BC and Physics C (Electricity & Magnetism) exams; they were least likely to take AP exams in English Language and English Literature. (*Figures 1 and 2*)
- More males in the GCS took AP exams in Calculus BC, Chemistry, Computer Science AB, Computer Science A, Physics B, Physics C (Electricity & Magnetism), and Physics C (Mechanics) (*Figures 5 and 6*)
- Females in the GCS were more likely to take AP exams in Biology, Calculus AB, English Language, English Literature, and US History. (*Figures 5 and 6*)
- AP test-takers in the GCS were more likely to come from households with annual incomes less than \$40,000 as compared to test-takers in the national sample. (*Tables 2-4*)

Advanced Placements Examinations in the Great City Schools

Table 1
Number of Exams Administered:
GCS and Nation

SUBJECT TEST	CGCS Exams	National Exams	CGCS as % of National Exams
Biology	3,480	44,264	7.9%
Calculus AB	8,362	108,442	7.7%
Calculus BC	2,175	24,735	8.8%
Chemistry	1,781	21,562	8.3%
Computer Science AB	288	3,553	8.1%
Computer Science A	522	6,255	8.3%
English Language	1,791	26,523	6.8%
English Literature	14,719	164,583	8.9%
Physics B	1,639	17,422	9.4%
Physics C (Electricity & Magnetism)	535	6,376	8.4%
Physics C (Mechanics)	1,237	12,692	9.7%
US History	1,579	13,949	11.3%
Total Number of AP Exams*	38,108	450,358	8.5%

*Totals do not include students who took exams in the additional 21 AP subject areas.

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Figure 1
GCS Test-Takers by Ethnicity: Biology, Calculus AB, Calculus BC, Chemistry, Computer Science AB, Computer Science A

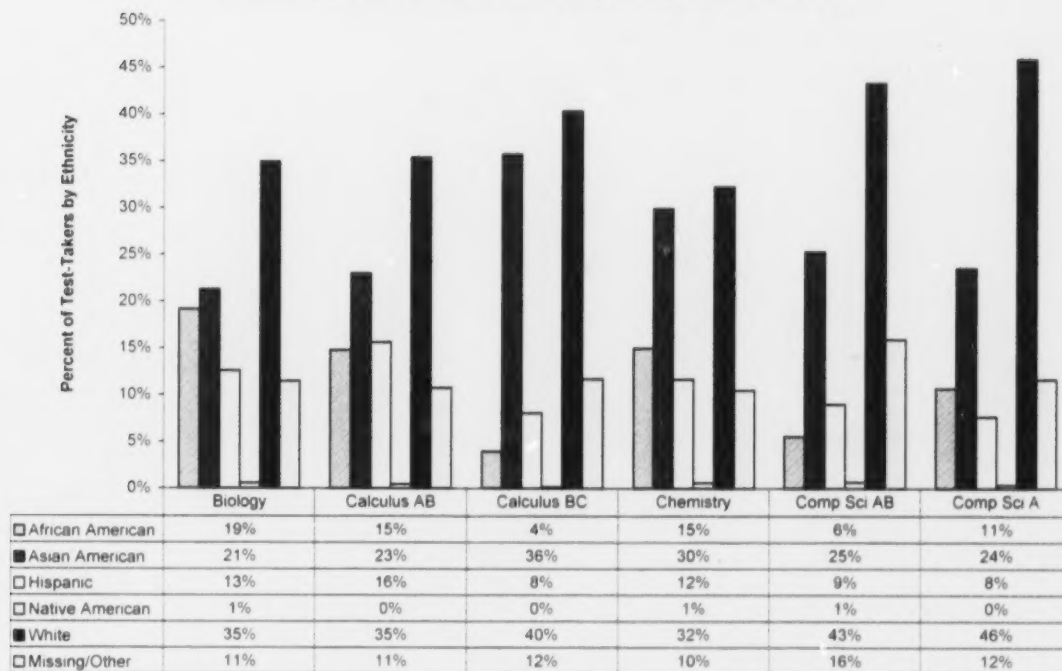
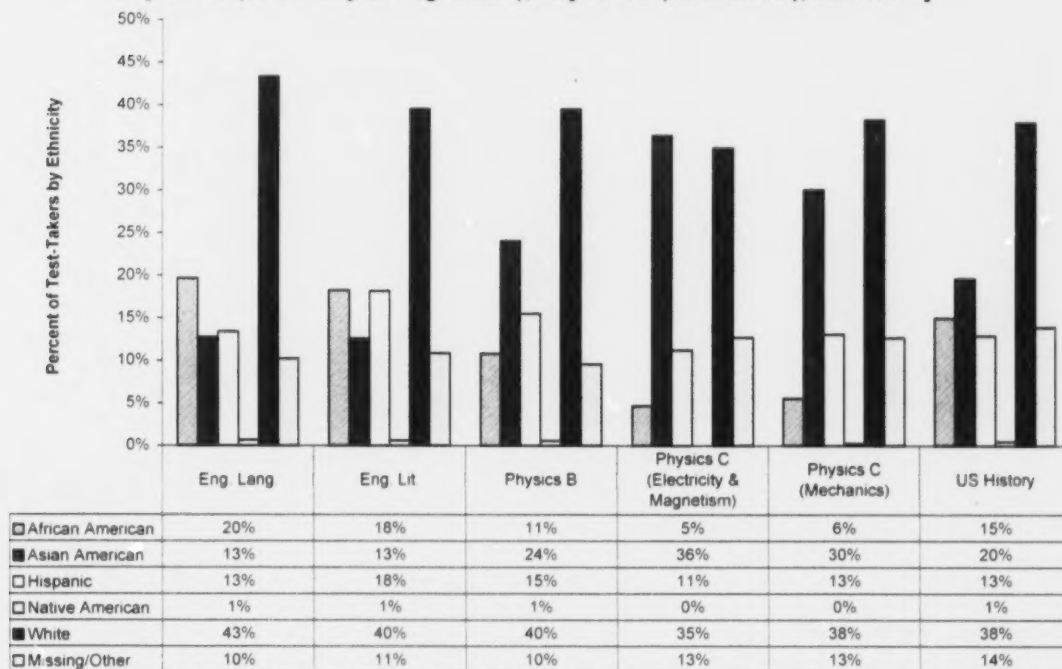


Figure 2
GCS Test-Takers by Ethnicity: English Language, English Literature, Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), US History



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Figure 3
National Test-Takers by Ethnicity: Biology, Calculus AB, Calculus BC, Chemistry, Computer Science AB, Computer Science A

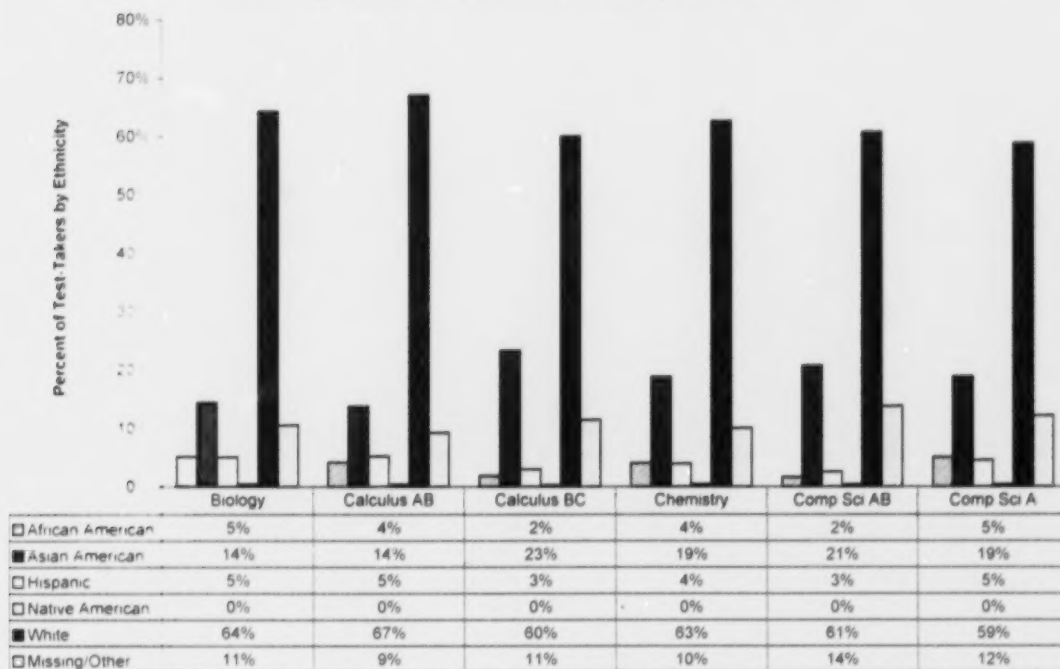


Figure 4
National Test-Takers by Ethnicity: English Language, English Literature, Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), US History

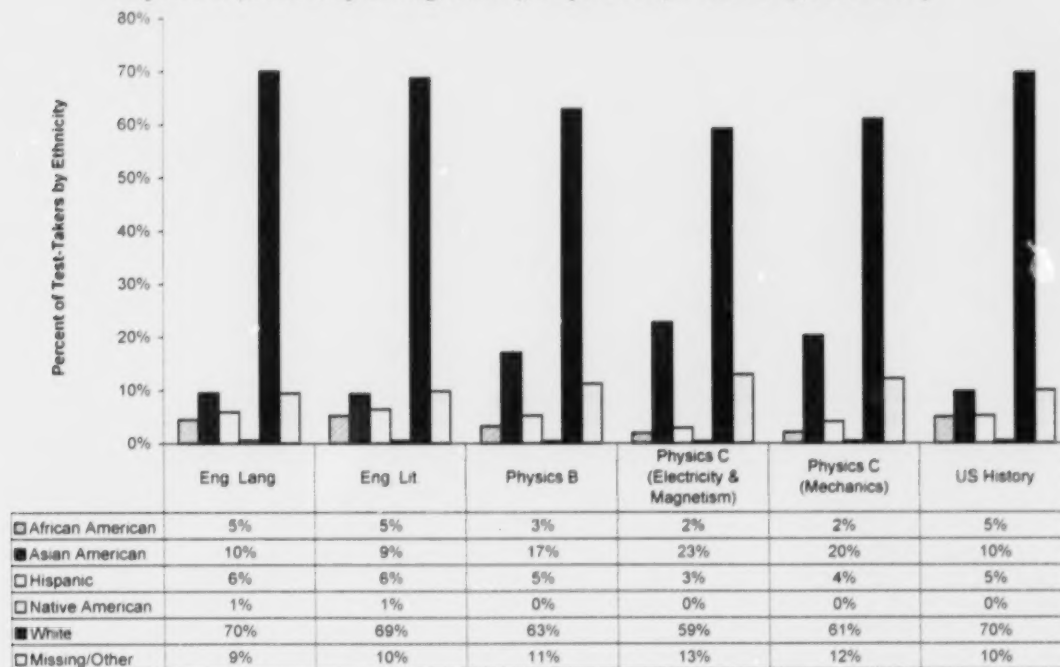


Figure 5
GCS Test-Takers by Gender: Biology, Calculus AB, Calculus BC, Chemistry, Computer Science AB, Computer Science A

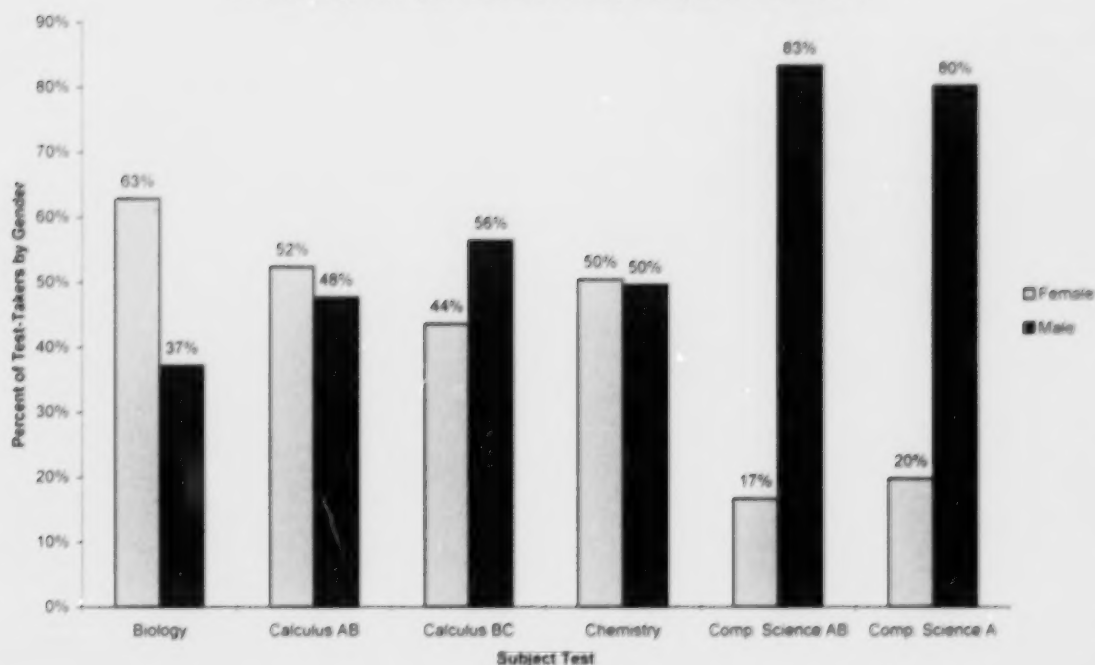


Figure 6
GCS Test-Takers by Gender: English Language, English Literature, Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), US History

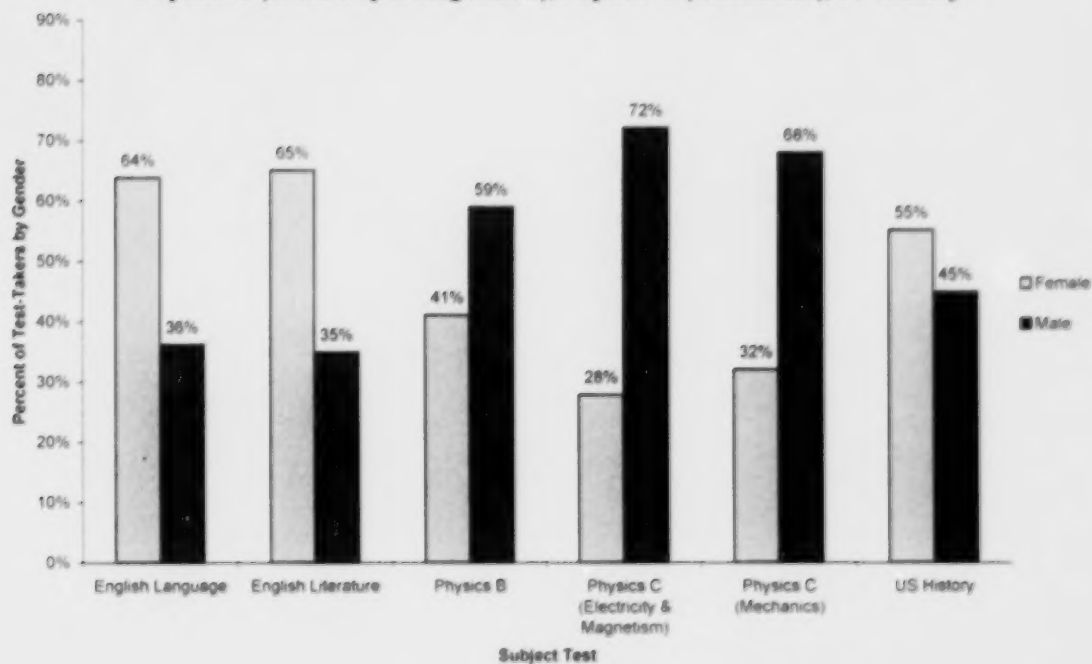


Figure 7
National Test-Takers by Gender: Biology, Calculus AB, Calculus BC, Chemistry, Computer Science AB, Computer Science A

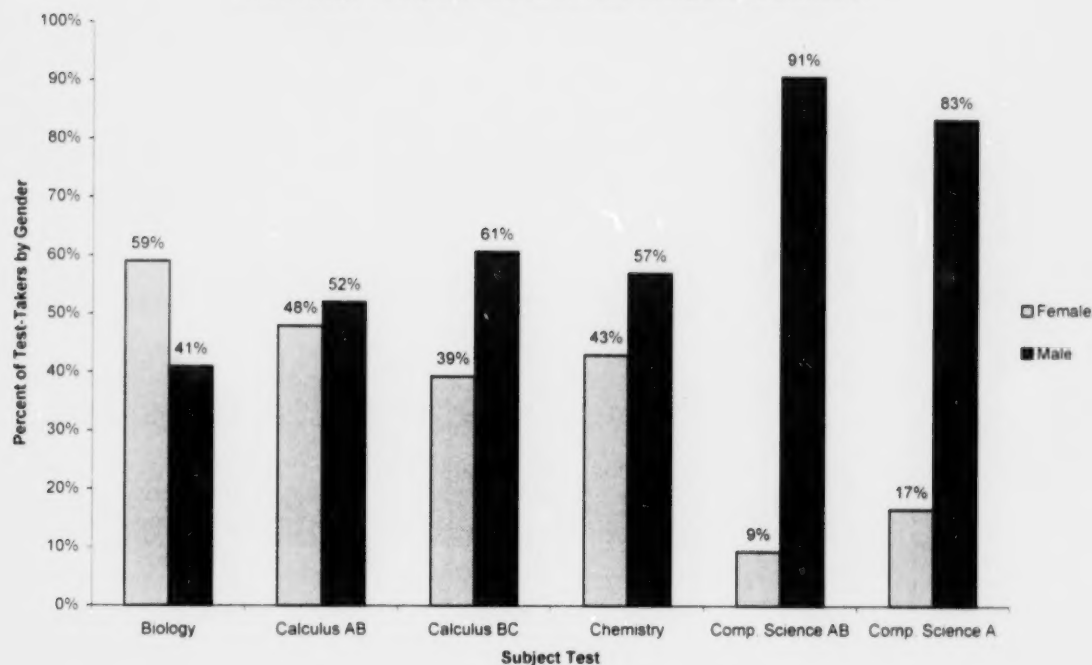


Figure 8
National Test-Takers by Gender: English Language, English Literature, Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), US History

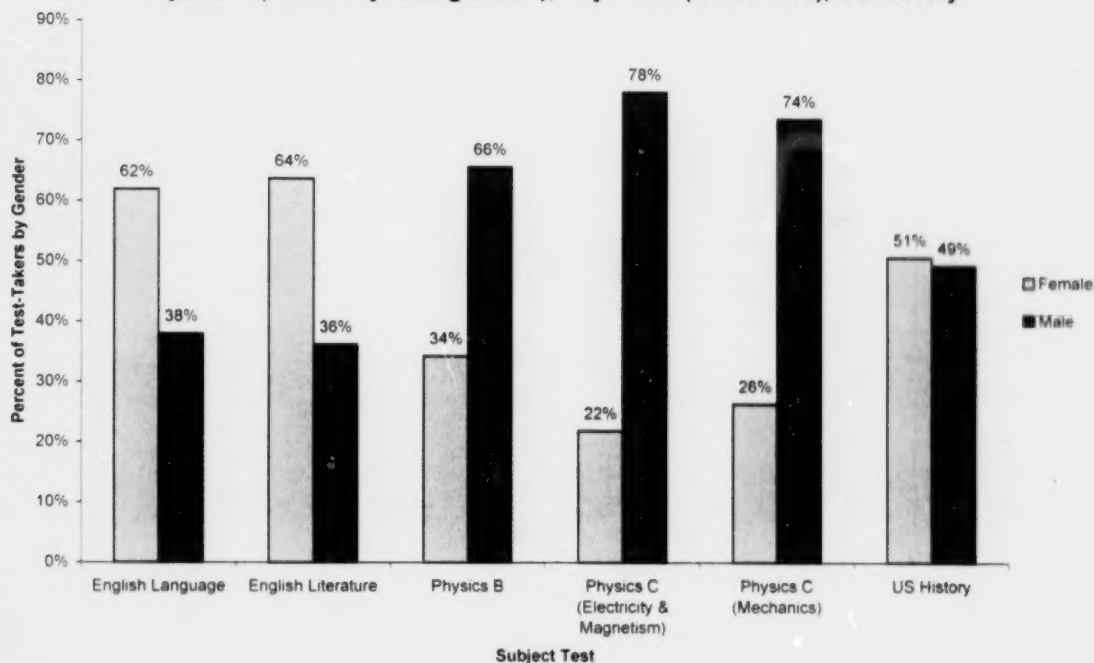


Table 2
GCS and National Test-Takers by Household Income:
Biology, Calculus AB, Calculus BC, and Chemistry

Household Income (in dollars)	Biology		Calculus AB		Calculus BC		Chemistry	
	CGCS	National	CGCS	National	CGCS	National	CGCS	National
No Response	199	1,907	1,098	14,875	338	4,441	230	3,069
Less than 10,000	78	209	598	1,915	122	373	116	386
10,000-25,000	254	904	1,627	6,955	374	1,248	384	1,436
25,000-40,000	218	1,304	1,223	10,411	272	1,894	264	2,003
40,000-60,000	216	1,946	1,121	15,008	287	2,871	249	2,866
60,000-80,000	145	1,693	802	13,862	218	3,186	160	2,674
80,000-100,000	92	1,200	450	9,666	162	2,592	97	1,995
Over \$100,000	132	2,162	601	17,209	247	5,778	131	3,748
Total	1,334	11,325	7,520	89,901	2,020	22,383	1,631	18,177

Table 3
GCS and National Test-Takers by Household Income:
Computer Science AB, Computer Science A, English Language, and English Literature

Household Income (in dollars)	Comp Sci AB		Comp Sci A		English Language		English Literature	
	CGCS	National	CGCS	National	CGCS	National	CGCS	National
No Response	52	733	82	1,076	204	3,220	1,845	22,295
Less than 10,000	11	58	23	109	73	393	847	2,649
10,000-25,000	46	181	104	441	279	1,453	2,487	10,261
25,000-40,000	30	255	81	633	261	2,444	2,191	16,031
40,000-60,000	45	432	73	858	271	3,545	2,057	22,802
60,000-80,000	24	461	57	797	200	3,322	1,486	21,071
80,000-100,000	15	341	34	539	126	2,313	919	14,506
Over \$100,000	31	734	24	961	154	4,052	1,271	25,520
Total	254	3,195	478	5,414	1,568	20,742	13,103	135,135

*Total number of test-takers by household income does not equal the total number of AP test-takers. Household income questions are from the Student Descriptive Questionnaire which is part of the registration for the SAT exams. Data will not be included unless students took both the SAT and AP exams. The 'No Response' category includes students who received the questionnaire but did not respond to this particular question.

Advanced Placement Examinations in the Great City Schools

Table 4
GCS and National Test-Takers by Household Income:
Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), and US History

Household Income (in dollars)	Physics B		Physics C (Elec. & Magnetism)		Physics C (Mechanics)		US History	
	CGCS	National	CGCS	National	CGCS	National	CGCS	National
No Response	203	2,783	77	1,195	179	2,244	199	1,907
Less than 10,000	102	336	22	81	73	200	78	209
10,000-25,000	296	1,122	81	281	205	666	254	904
25,000-40,000	265	1,630	76	469	172	1,017	218	1,304
40,000-60,000	224	2,339	78	754	183	1,610	216	1,946
60,000-80,000	170	2,246	68	812	140	1,626	145	1,693
80,000-100,000	123	1,662	39	702	92	1,364	92	1,200
Over \$100,000	158	3,113	61	1,581	124	2,921	132	2,162
Total	1,541	15,231	502	5,875	1,168	11,648	1,334	11,325

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*Total number of test-takers by household income does not equal the total number of AP test-takers. Household income questions are from the Student Descriptive Questionnaire which is part of the registration for the SAT exams. Data will not be included unless students took both the SAT and AP exams. The 'No Response' category includes students who received the questionnaire but did not respond to this particular question.

III. GCS AND NATIONAL MEAN AP SCORES

- GCS test-takers posted their highest average scores in Calculus BC (3.3), Physics C (Electricity & Magnetism) (2.9) and Physics C (Mechanics) (2.9).¹ (*Figures 9 and 10*)
- Test-takers nationally posted their highest average scores in Calculus BC (3.5), Physics C (Electricity and Magnetism) (3.3), Physics C (Mechanics) (3.2), and Computer Science AB (3.2). (*Figures 9 and 10*)
- GCS students scored lowest in AP Chemistry (2.2) and Physics B (2.2). (*Figures 9 and 10*)
- National test-takers scored lowest in Computer Science A (2.7). (*Figures 9 and 10*)
- The gap between GCS students and students nationally ranged from 0.2 points in Calculus BC to 0.6 points in Physics B and Chemistry. (*Figure 11*)

¹ A score of 3.0 is typically required to receive college credit.

Figure 9
GCS and National Mean AP Scores: Biology, Calculus AB, Calculus BC, Chemistry, Computer Science AB, Computer Science A

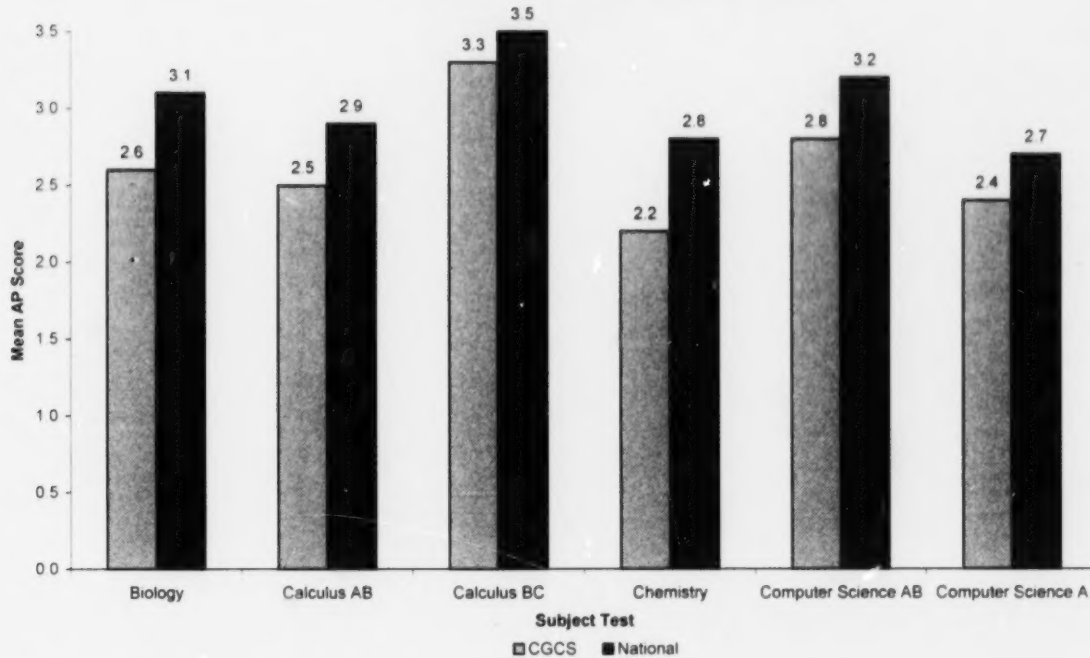


Figure 10
GCS and National Mean AP Scores: English Language, English Literature, Physics B, Physics C (Electricity & Magnetism), Physics C (Mechanics), US History

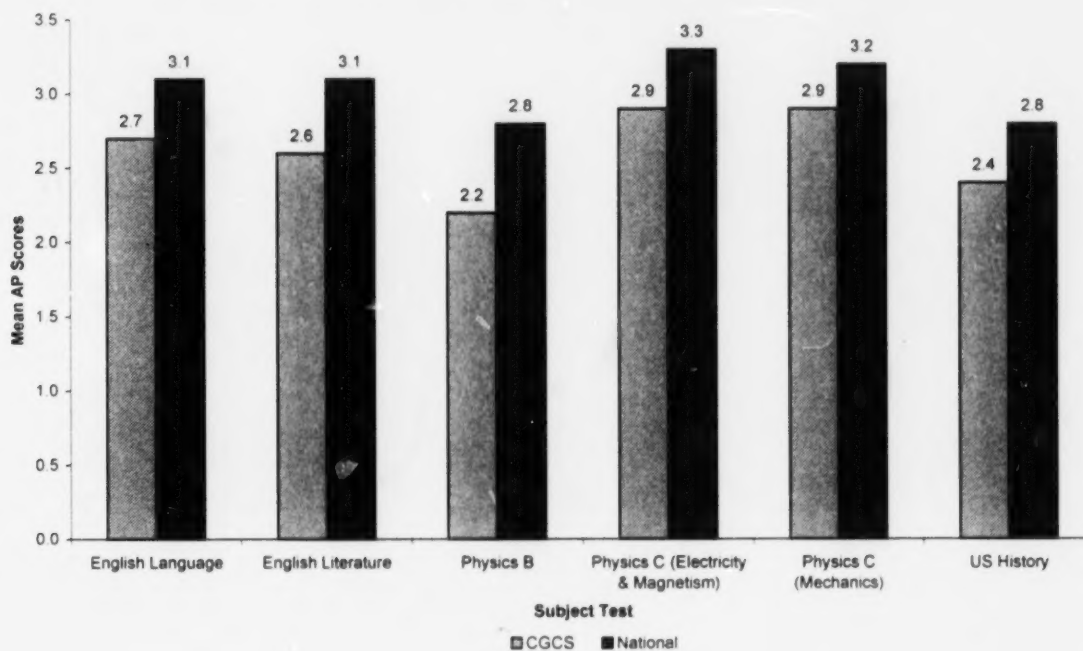
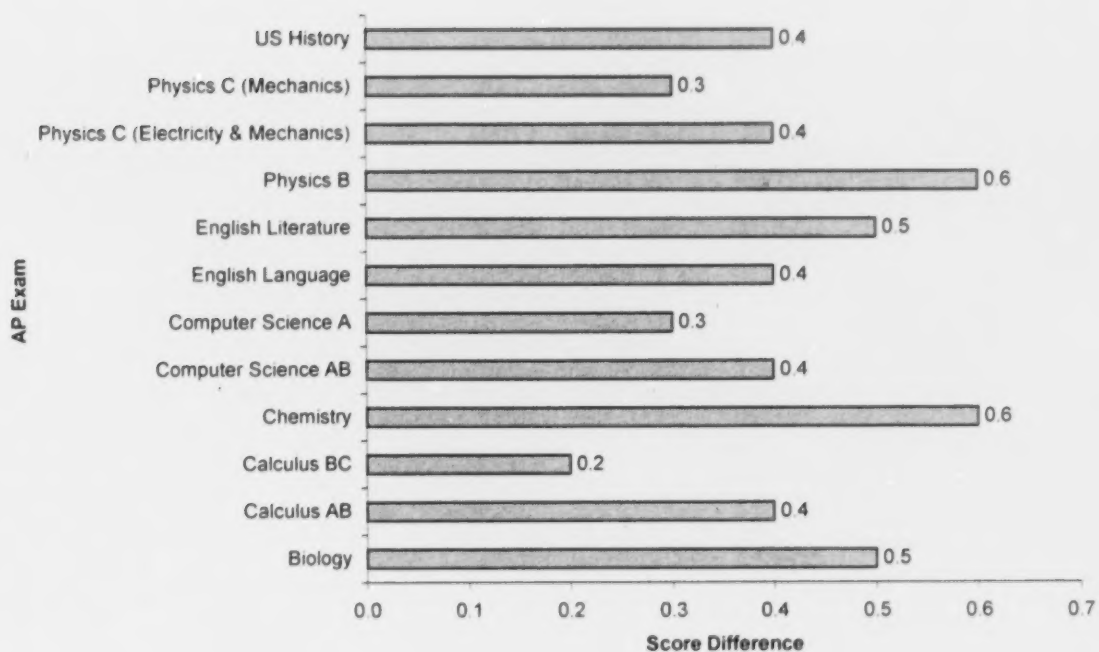


Figure 11
Mean AP Exam Score Differences between National Test-Takers
and GCS Test-Takers
(National - GCS)



IV. MEAN AP SCORES AND ACHIEVEMENT GAPS BY ETHNICITY

- Mean AP scores for White students in the GCS were higher in Biology, Calculus AB, Chemistry, English Language, English Literature, and US History than all other racial groups in city schools. (*Figures 12 and 13*)
- Mean AP scores for African American students in the GCS were lower in Biology, Calculus AB, Chemistry, English Language, English Literature, Physics B, and US History than all other racial groups in city schools and nationally. (*Figures 12 and 13*)
- The mean AP score differences between White and Asian American students in the GCS ranged from 0.0 in Physics B to 0.4 in English Literature and English Language. (*Figure 17*)
- The mean AP score differences between White and African American students in the GCS ranged from 0.9 in Physics B to 1.2 in English Language and Chemistry. (*Figure 16*)
- The mean AP score differences between White and Hispanic students in the GCS ranged from 0.7 in US History, Chemistry and Biology to 0.9 in English Language. (*Figure 18*)
- The gaps among racial groups in the GCS were similar to gaps among racial groups nationally. (*Figures 12-15*)

Advanced Placement Examinations in the Great City Schools

Figure 12
GCS Mean AP Scores by Ethnicity: Biology, Calculus AB, Chemistry, English Language

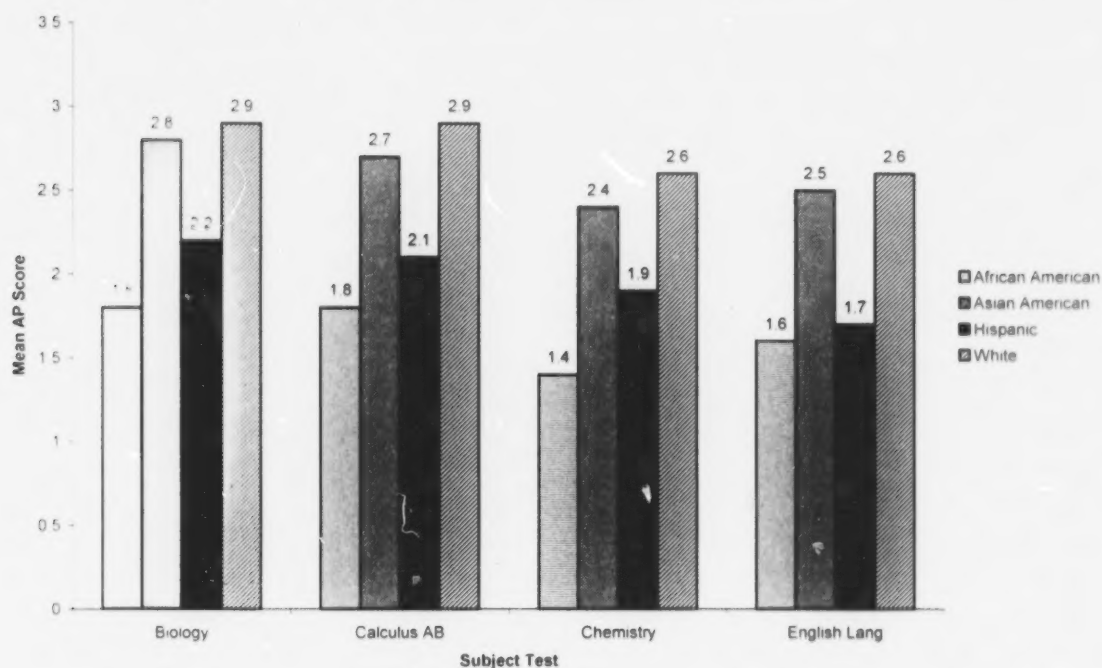


Figure 13
GCS Mean AP Scores by Ethnicity: English Literature, Physics B, US History

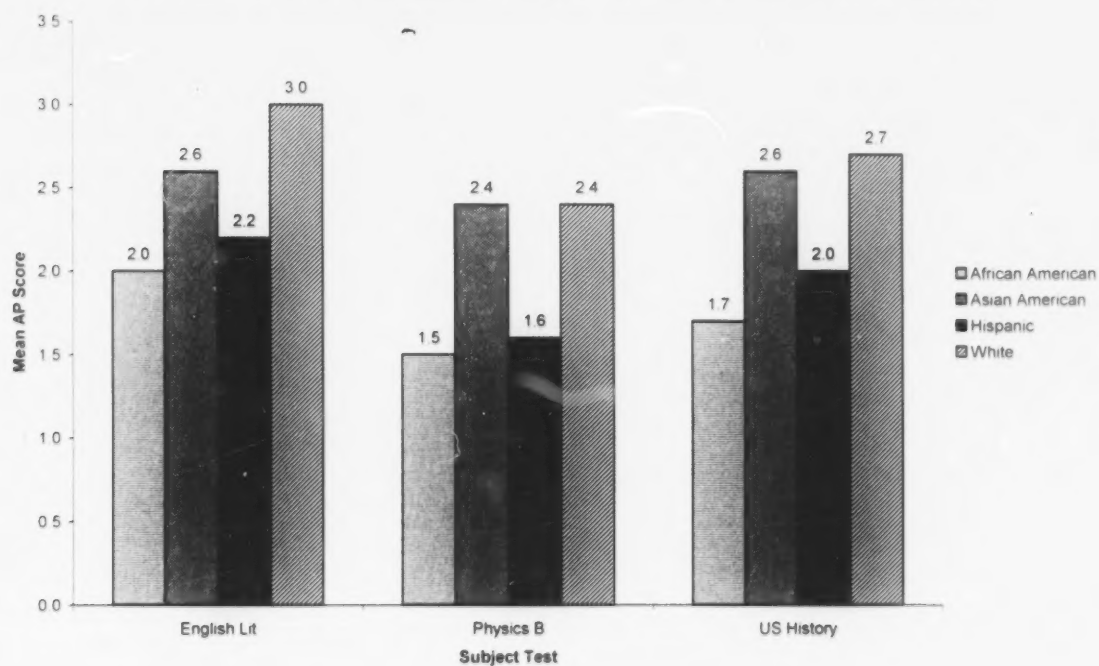


Figure 14
National Mean AP Scores by Ethnicity: Biology, Calculus AB, Chemistry, English Language

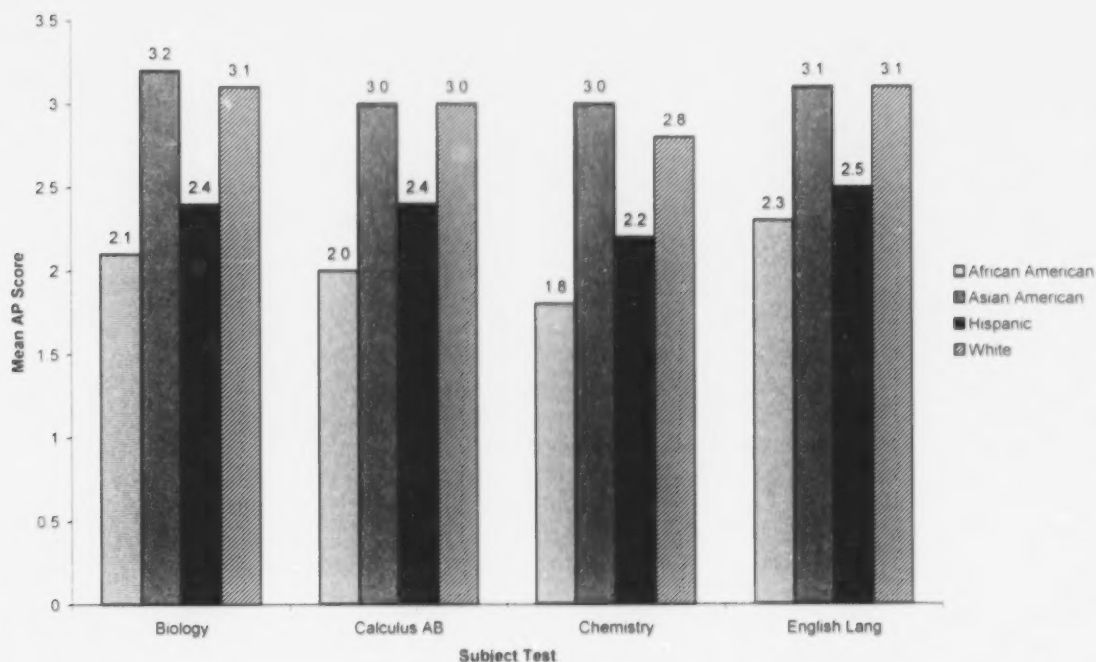


Figure 15
National Mean AP Scores by Ethnicity: English Literature, Physics B, US History

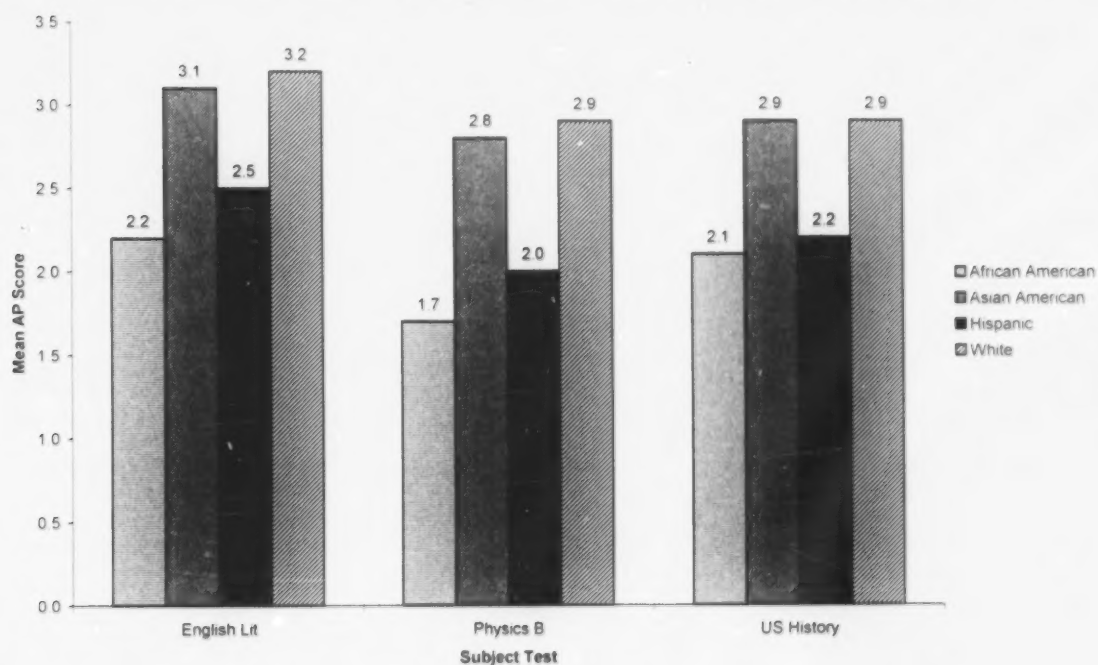


Figure 16: Mean AP Score Differences between GCS White Students and GCS African American Students (White – African American)

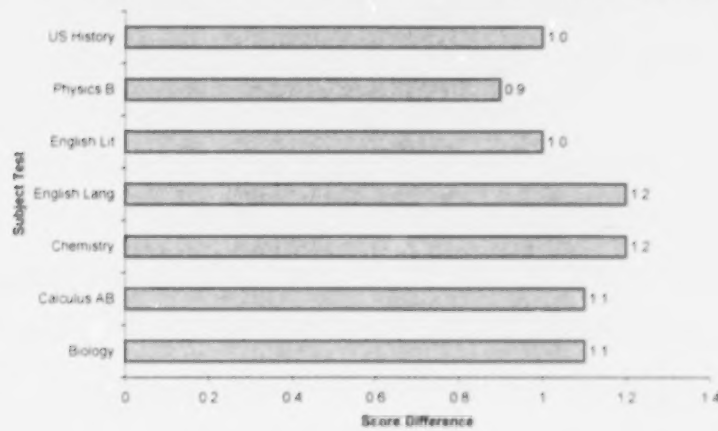


Figure 17: Mean AP Score Differences between GCS White Students and GCS Asian American Students (White – Asian American)

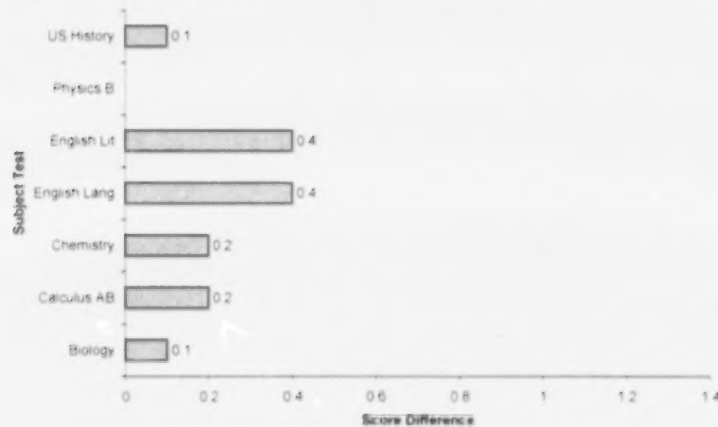


Figure 18: Mean AP Score Differences between GCS White Students and GCS Hispanic Students (White – Hispanic)

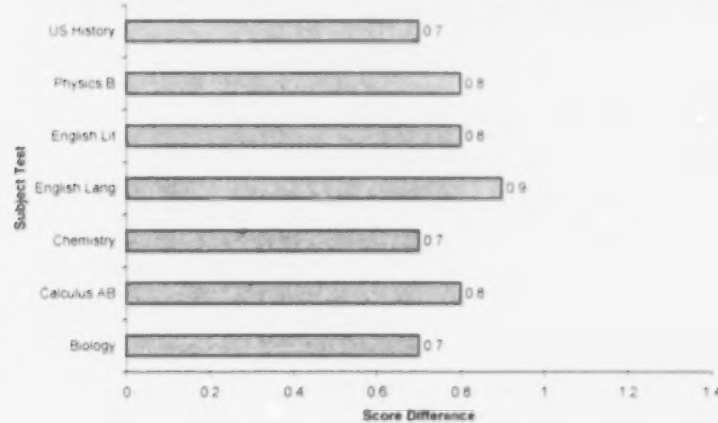


Figure 19: Mean AP Score Differences between the Nation's White Students and GCS African American Students (White – African American)

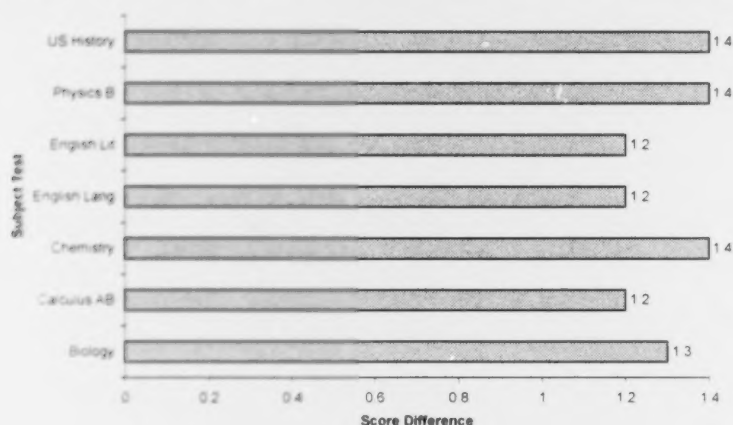


Figure 20: Mean AP Score Differences between the Nation's White Students and GCS Asian American Students (White – Asian American)

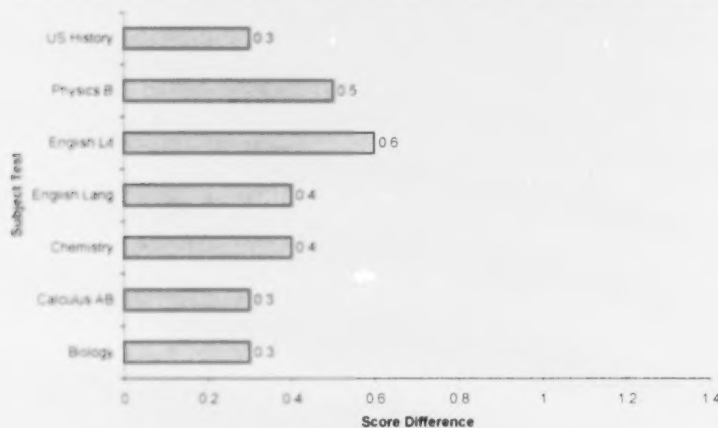
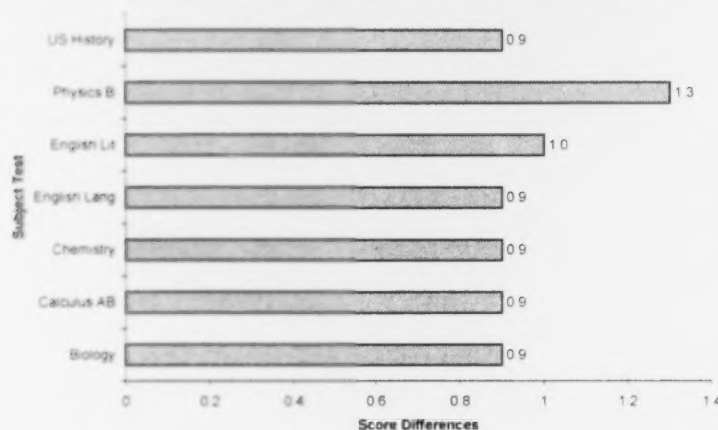


Figure 21: Mean AP Score Differences between the Nation's White Students and GCS Hispanic Students (White – Hispanic)



V. MEAN AP SCORES AND ACHIEVEMENT GAPS BY GENDER

- Males in the GCS scored higher than females in Biology, Calculus AB, Chemistry, Physics B, and US History. (*Figure 22*)
- Males and females in the GCS scored the same in English Language and English Literature. (*Figure 22*)
- Males scored higher than females nationally in all subject exams except English Literature, where they scored equally. (*Figure 23*)
- Average AP score differences between males and females in the GCS ranged from 0.0 in English Language and English Literature to 0.4 in US History and Biology. (*Figure 24*)
- Average AP score differences between males nationally and females in the GCS ranged from 0.4 in English Language to 0.9 in Physics B, Chemistry, and Biology. (*Figure 25*)
- Achievement gaps between males and females in the GCS were similar to gaps between males and females nationally.

Figure 22
GCS Mean Scores by Gender: Biology, Calculus AB, Chemistry,
English Language, English Literature, Physics B, US History

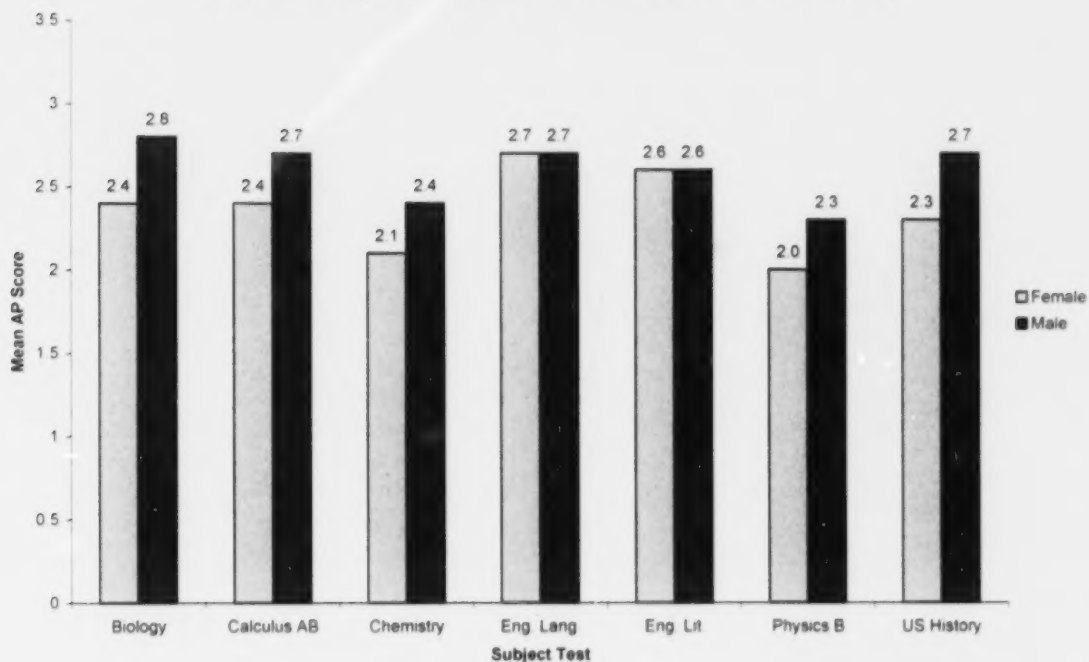


Figure 23
National Mean Scores by Gender: Biology, Calculus AB, Chemistry,
English Language, English Literature, Physics B, US History

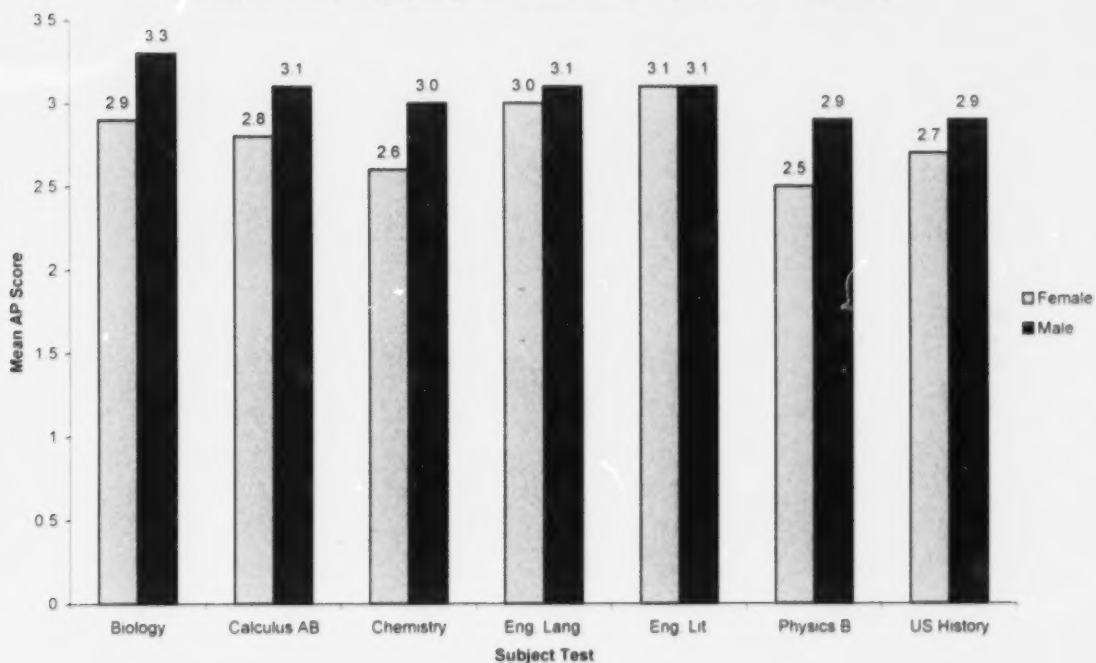


Figure 24

Mean AP Exam Score Differences between GCS Male and GCS Female Students: Biology, Calculus AB, Chemistry, English Language, English Literature, Physics, B, US History

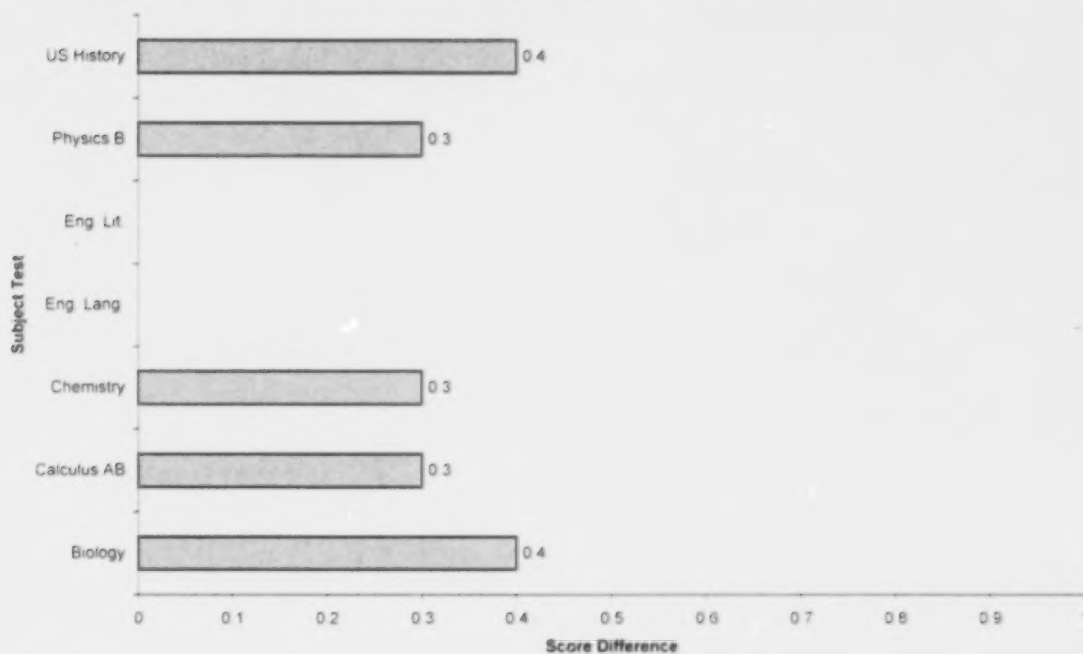
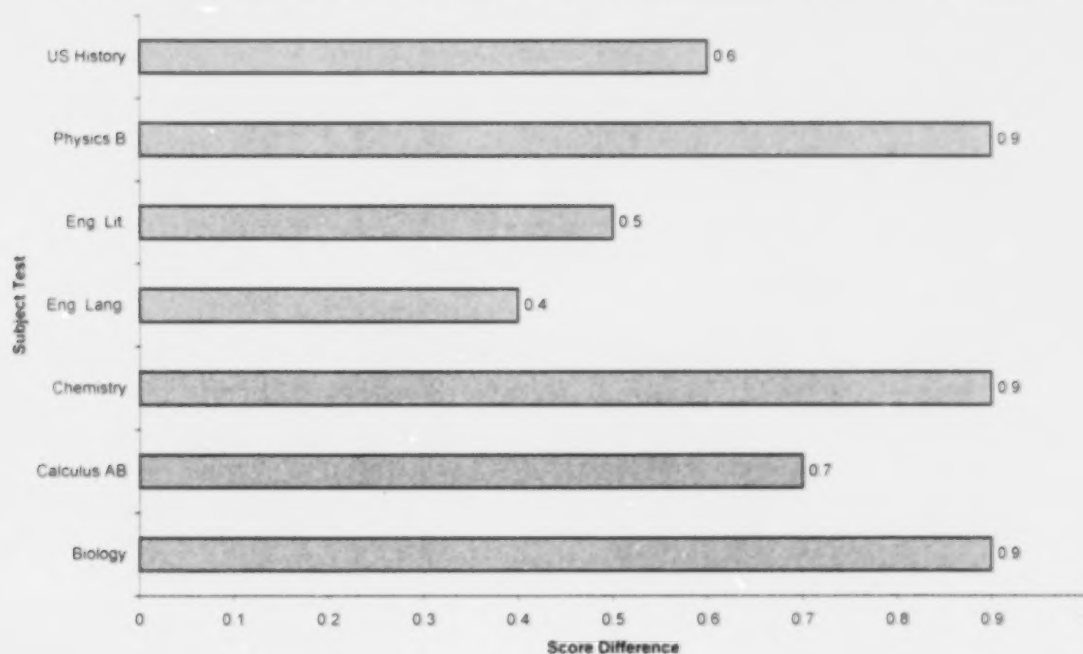


Figure 25

Mean AP Exam Score Differences between the Nation's Male and GCS Female Students: Biology, Calculus AB, Chemistry, English Language, English Literature, Physics, B, US History



VI. ACADEMIC PREPARATION OF GCS AND NATIONAL TEST-TAKERS BY ETHNICITY

- At least six out of 10 GCS and national AP test-takers had core or more academic preparation. *(Figures 26-32)*
- Test-takers in the GCS were somewhat more likely to have taken core courses than the national average. *(Figures 26-32)*
- African American test-takers in the GCS were less likely to have taken core courses in Biology, Chemistry, English Language, English Literature, and US History than all other racial groups. *(Figures 26, 28, 29, 30, and 32)*
- Hispanic test-takers in the GCS were more likely to have taken core courses in Chemistry than all other racial groups. *(Figure 28)*
- Asian American test-takers in the GCS were more likely to have taken core courses in English Language than African American or Hispanic test-takers. *(Figure 29)*
- African American test-takers in the GCS were more likely to have taken core courses in Physics B than Asian Americans. *(Figure 31)*

Figure 26

AP Biology
GCS and Nation: Percentage of Test-Takers with Core or More Academic Preparation by Ethnicity

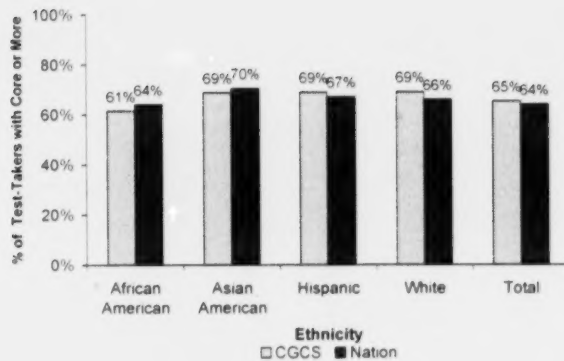


Figure 27

AP Calculus AB
GCS and Nation: Percentage of Test-Takers with Core or More Academic Preparation by Ethnicity

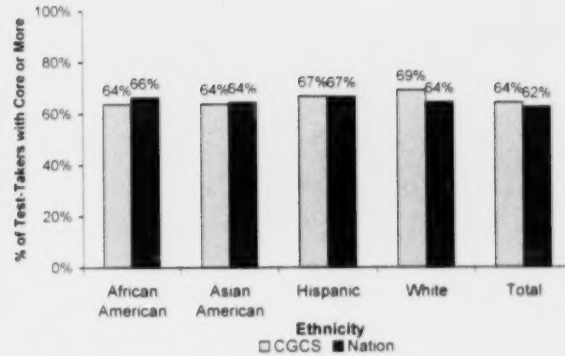


Figure 28

AP Chemistry
GCS and Nation: Percentage of Test-Takers with Core or More Academic Preparation by Ethnicity

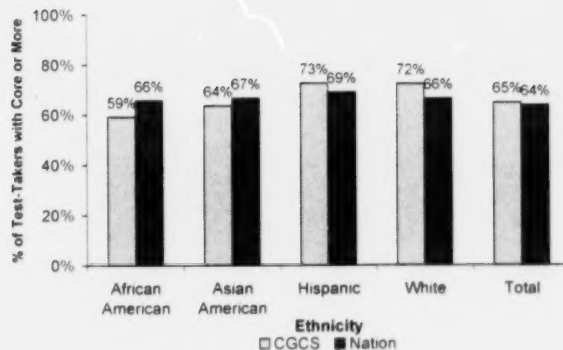
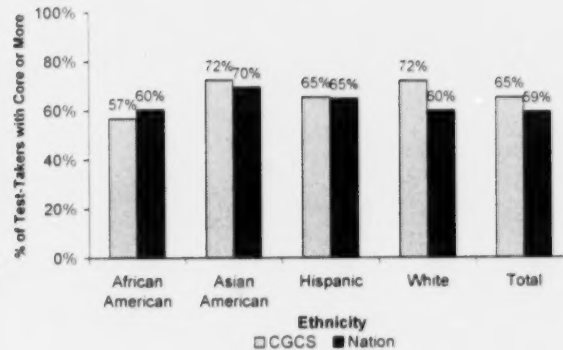


Figure 29

AP English Language
GCS and Nation: Percentage of Test-Takers with Core or More Academic Preparation by Ethnicity



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Figure 30

AP English Literature
GCS and Nation: Percentage of Test-Takers
with Core or More Academic Preparation
by Ethnicity

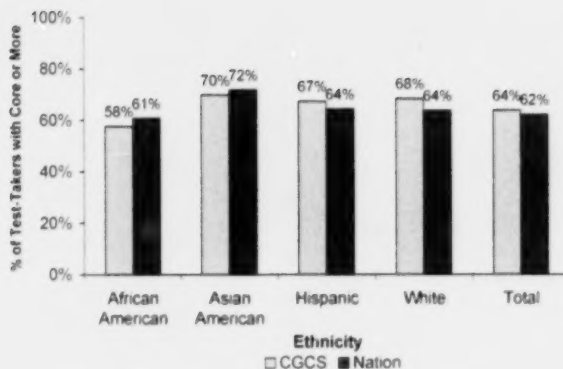


Figure 31

AP Physics B
GCS and Nation: Percentage of Test-Takers
with Core or More Academic Preparation
by Ethnicity

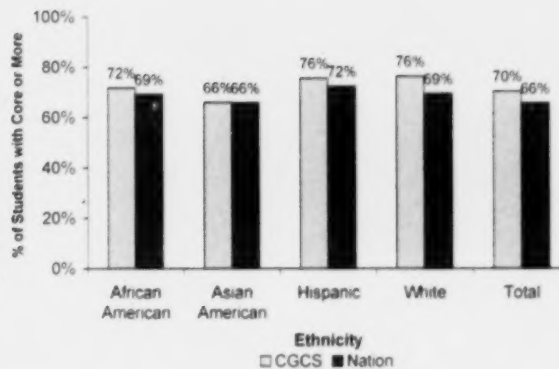
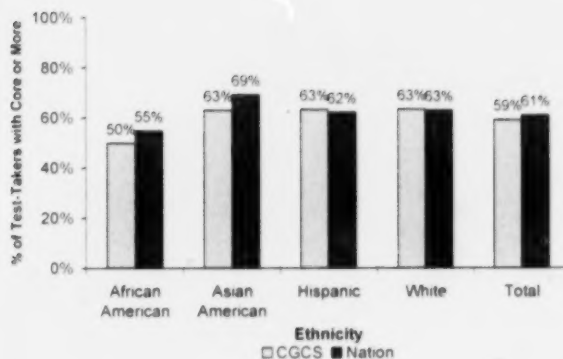


Figure 32

AP US History
GCS and Nation: Percentage of Test-Takers
with Core or More Academic Preparation
by Ethnicity



**VII. MEAN AP SUBJECT SCORES AND ACHIEVEMENT GAPS
BY ACADEMIC PREPARATION AND ETHNICITY**

- Students with core or more academic preparation outscore those with less academic preparation. *(Figures 33-39)*
- Students nationally with core or more academic preparation attained higher AP scores than GCS students with core or more academic preparation. *(Figures 33-39)*
- White test-takers in the GCS who took core courses scored better in most every subject than all other racial groups in city schools. *(Figures 33-39)*
- White students in the GCS and nationally with less than core preparation scored better in all subjects than Hispanic and African Americans who took core courses. *(Figures 33-39)*
- AP score gaps in the GCS between White and African American test-takers with core preparation ranged from 0.9 in US History to 1.2 in Biology. *(Figure 40)*
- AP score gaps in the GCS between White and Asian American test-takers with core preparation ranged from 0.0 in US History to 0.4 in English Literature and English Language. *(Figure 41)*
- AP score gaps in the GCS between White and Hispanic test-takers with core preparation ranged from 0.7 in US History, Calculus AB, and Biology to 1.0 in Physics B and Chemistry. *(Figure 42)*
- Racially identifiable AP score gaps among students with core preparation in the GCS were similar to racial gaps in the nation.

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Figure 33

AP Biology
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

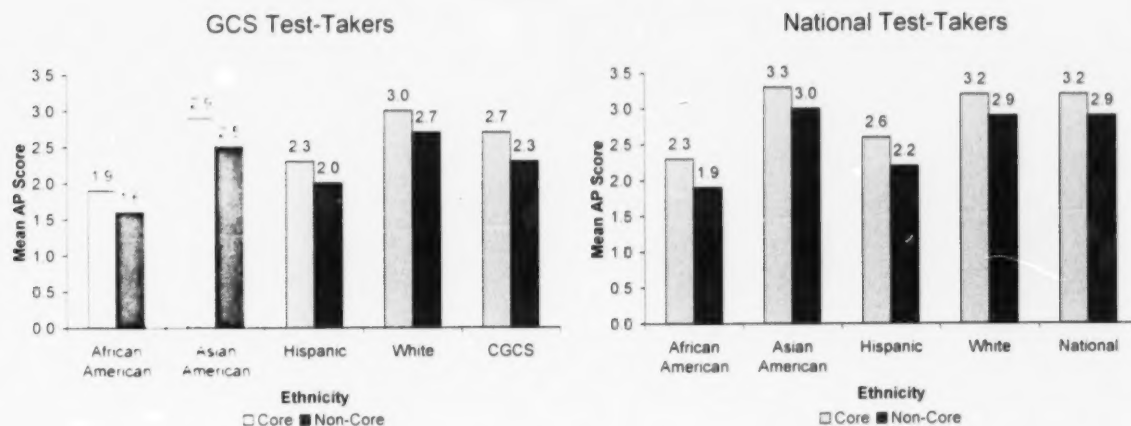


Figure 34

AP Calculus AB
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

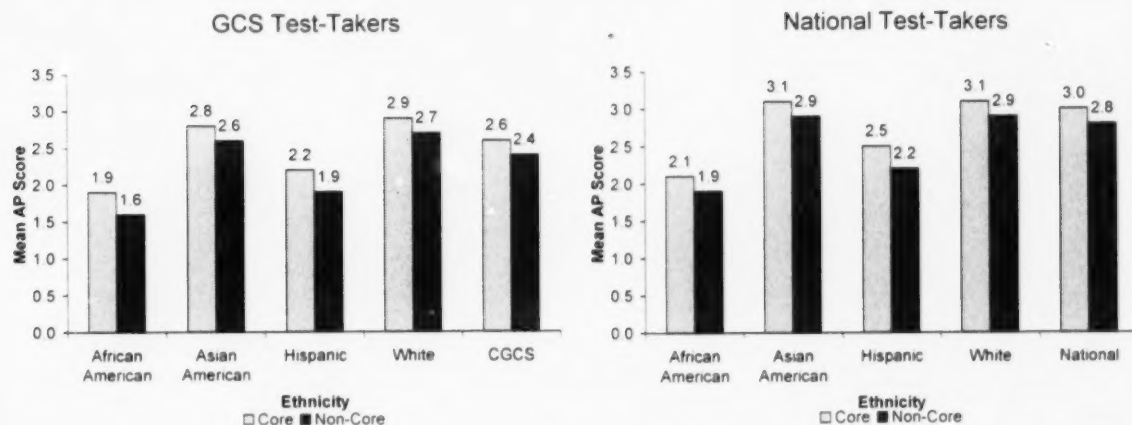


Figure 35

AP Chemistry
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

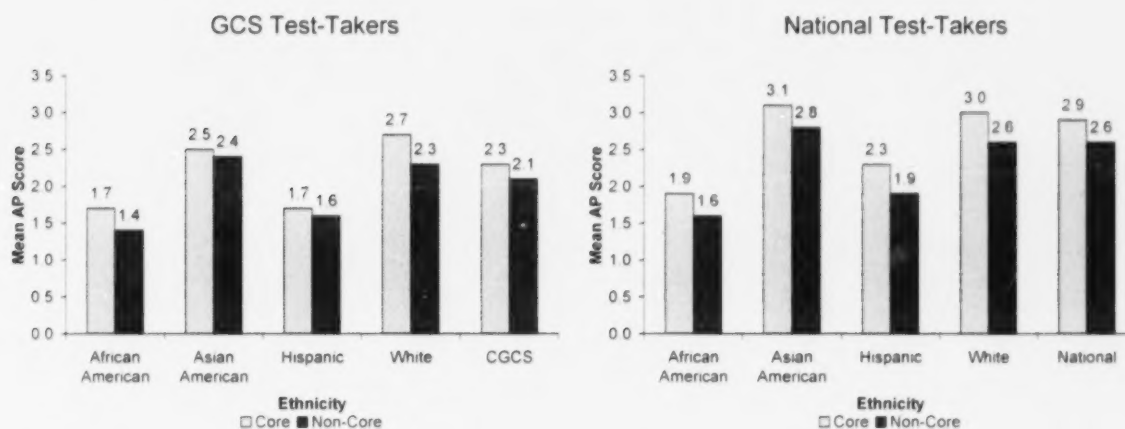


Figure 36

AP English Language
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

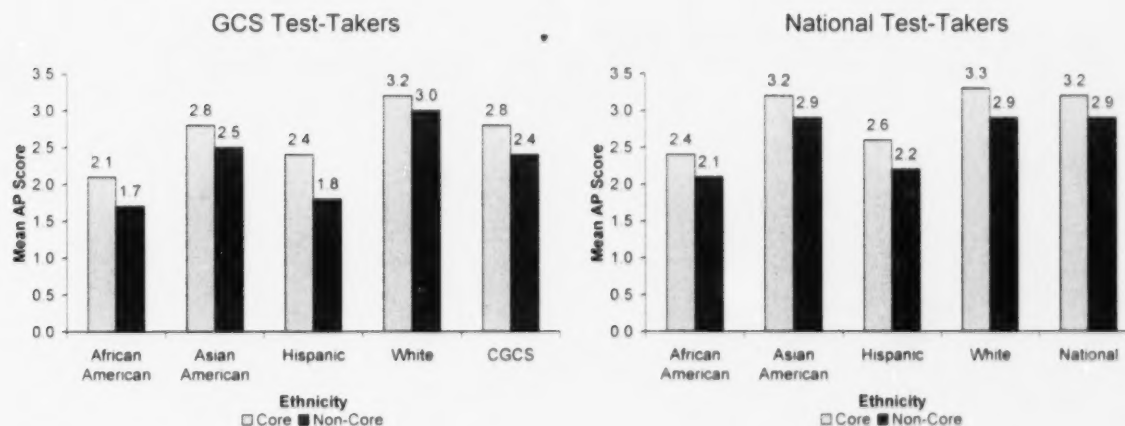


Figure 37

AP English Literature
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

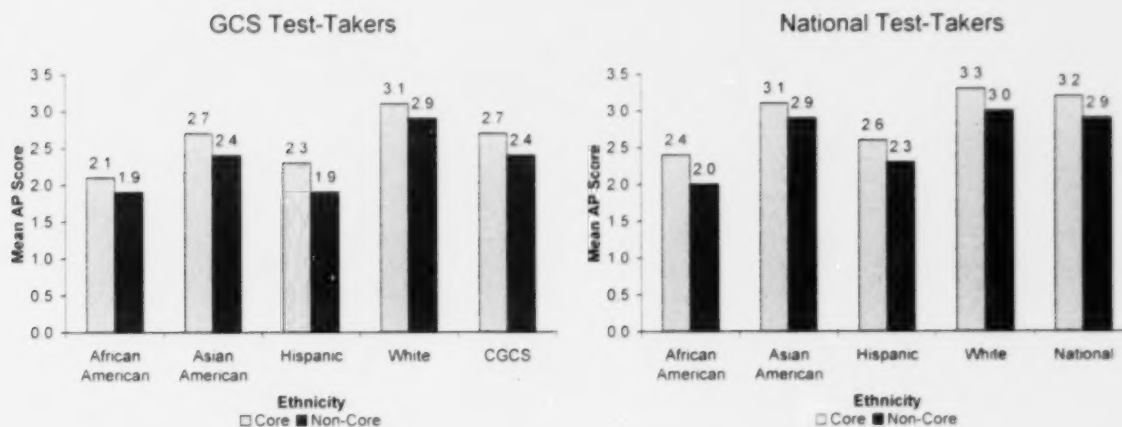


Figure 38

AP Physics B
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

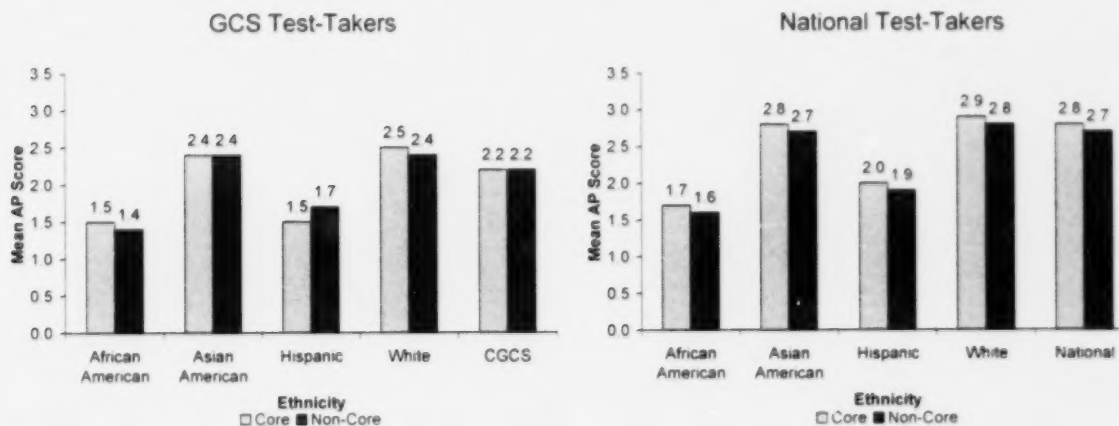


Figure 39

AP US History
GCS and National Mean Scores by Students with Core and Non-Core Academic Preparation, and by Ethnicity

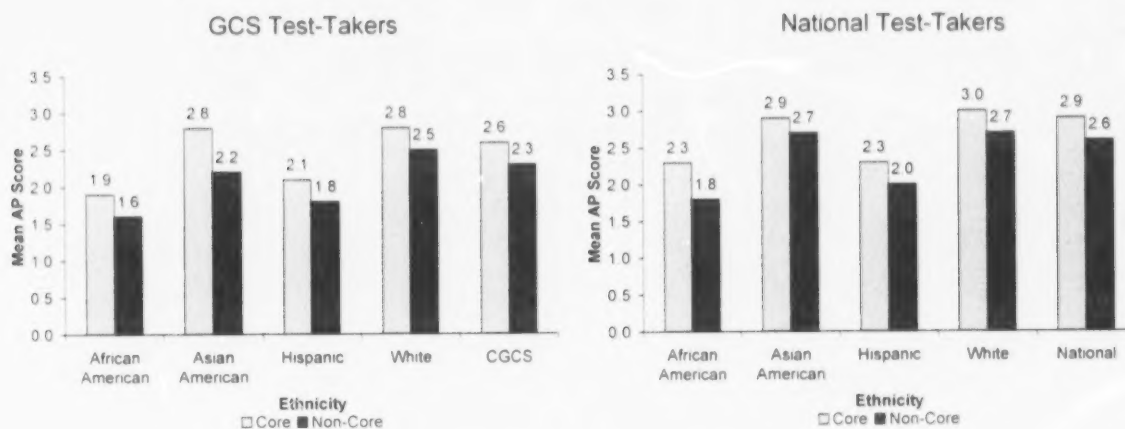


Figure 40: Mean AP Score Differences between GCS White Students and GCS African American Students with Core or More Academic Preparation (White – African American)

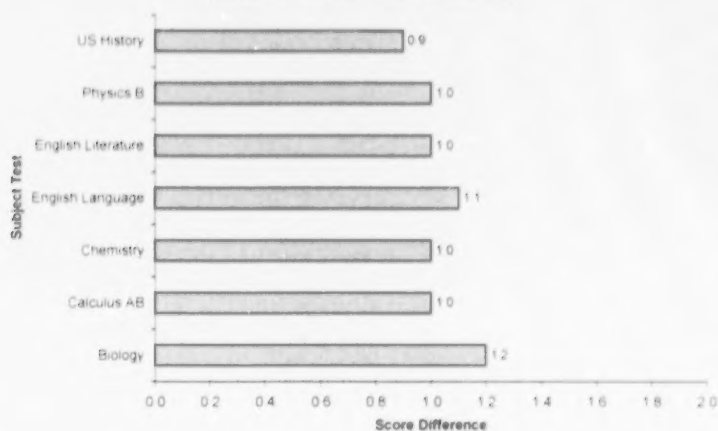


Figure 41: Mean AP Score Differences between GCS White Students and GCS Asian American Students with Core or More Academic Preparation (White – Asian American)

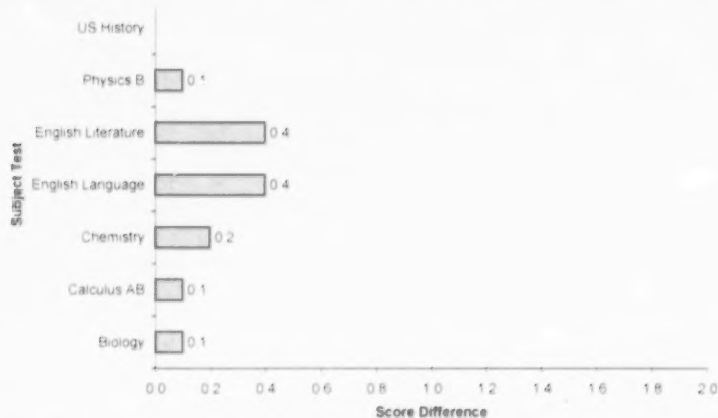


Figure 42: Mean AP Score Differences between GCS White Students and GCS Hispanic Students with Core or More Academic Preparation (White – Hispanic)

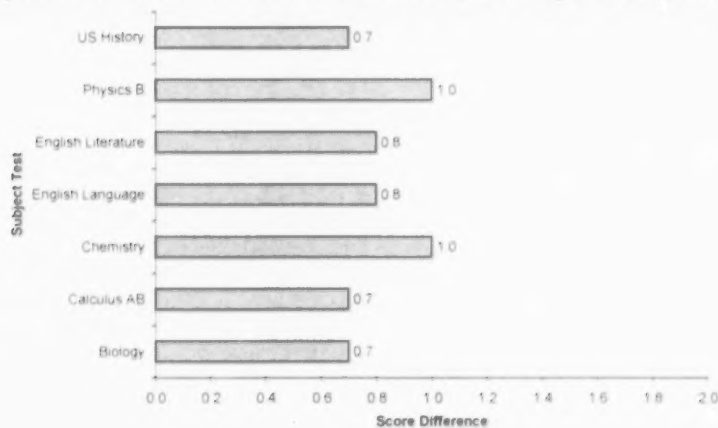


Figure 43: Mean AP Exam Score Differences between the Nation's White Students and GCS African American Students with Core or More Academic Preparation (White - African American)

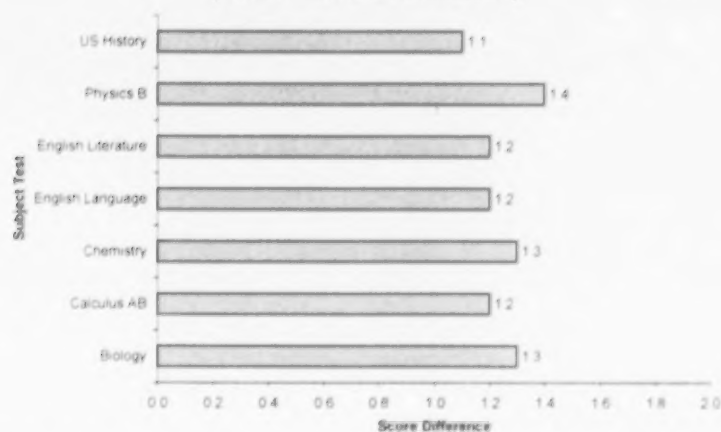


Figure 44: Mean AP Exam Score Differences between the Nation's White Students and GCS Asian American Students with Core or More Academic Preparation (White - Asian American)

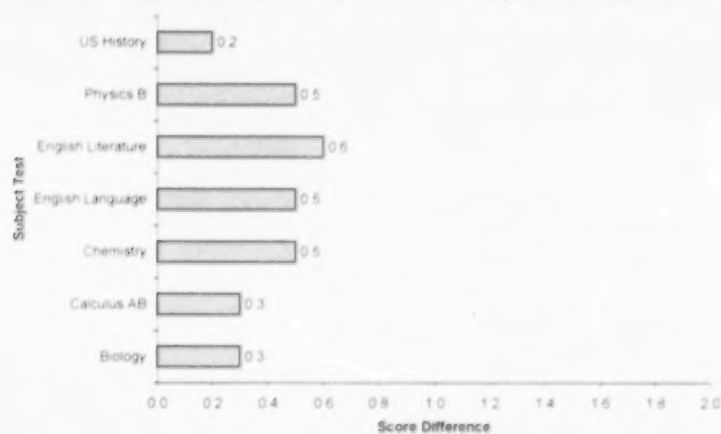
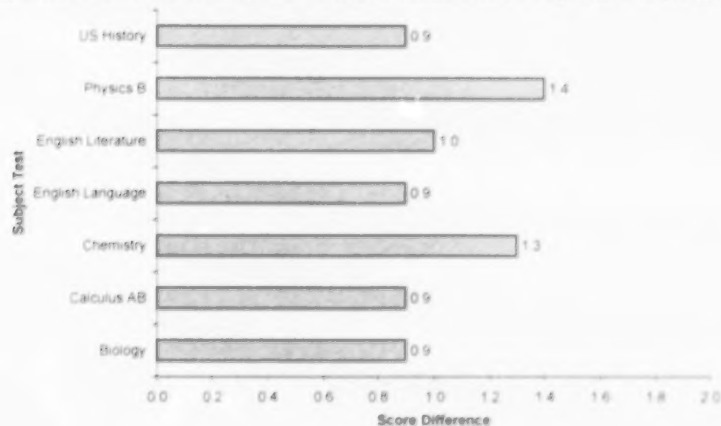


Figure 45: Mean AP Exam Score Differences between the Nation's White Students and GCS Hispanic Students with Core or More Academic Preparation (White - Hispanic)



VIII. MEAN AP SUBJECT SCORES AND ACHIEVEMENT GAPS BY HOUSEHOLD INCOME

- AP scores in the GCS and nationally were strongly related to household income. (*Figures 46-73*)
- AP scores nationally were higher in every subject and at every income level than AP scores in the GCS. (*Figures 46-73*)
- The only GCS students who had average scores of 3.0 or above in any AP subject were those with household incomes above \$80,000.
- AP score gaps in the GCS between the poorest and the richest students ranged from 1.2 in English Literature to 0.6 in Physics AB. (*Figures 48, 52, 56, 60, 64, 68, and 72*)
- AP score gaps between the GCS and the nation were generally smallest at the highest household income levels and largest at the lowest household income levels. (*Figures 48, 49, 52, 53, 56, 57, 60, 61, 64, 65, 69, 72, and 73*)

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Figure 46
AP Biology
GCS Mean Scores by Household Income

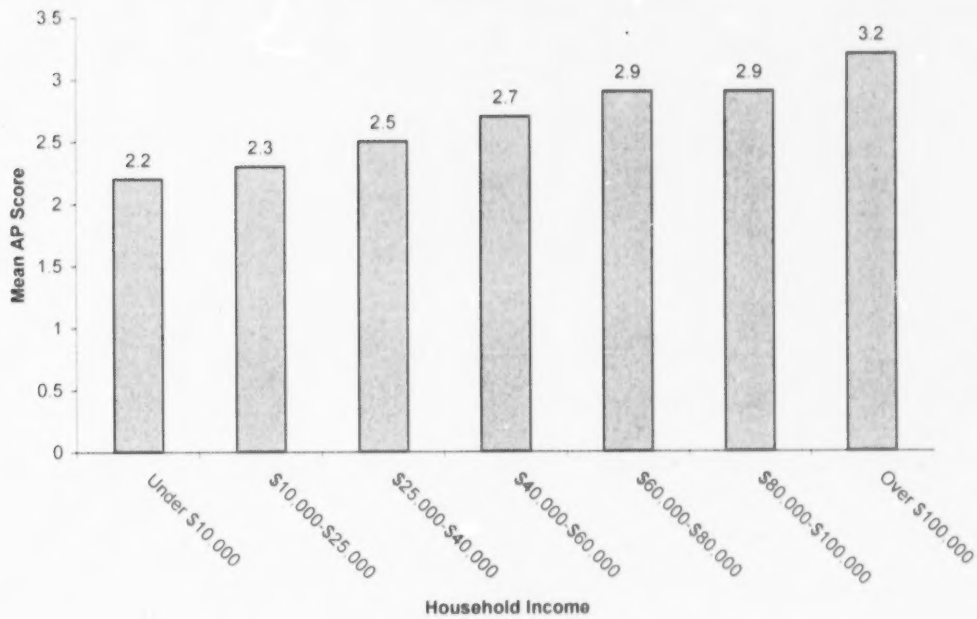


Figure 47
AP Biology
National Mean Scores by Household Income

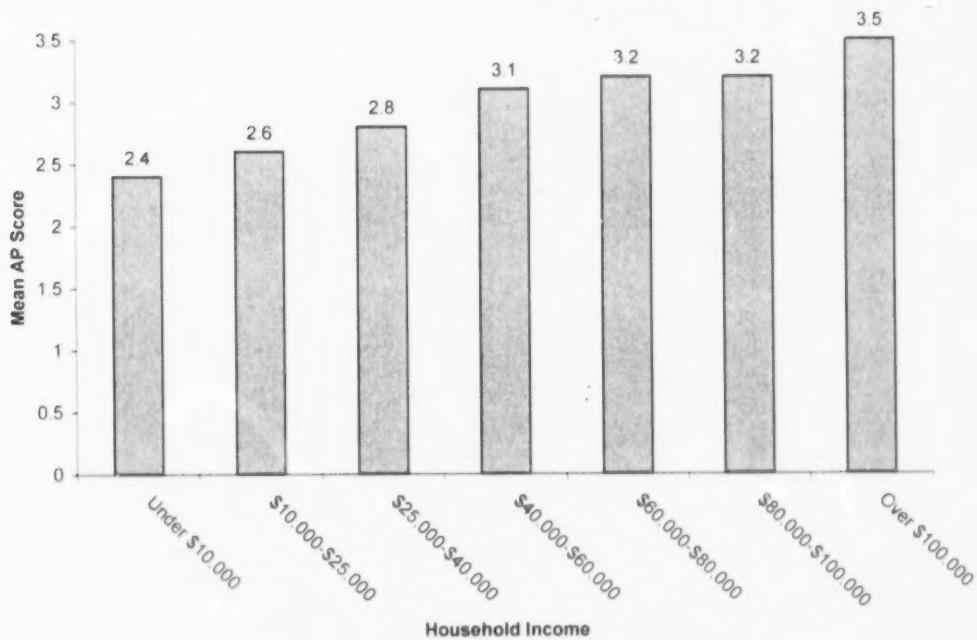


Figure 48
AP Biology
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

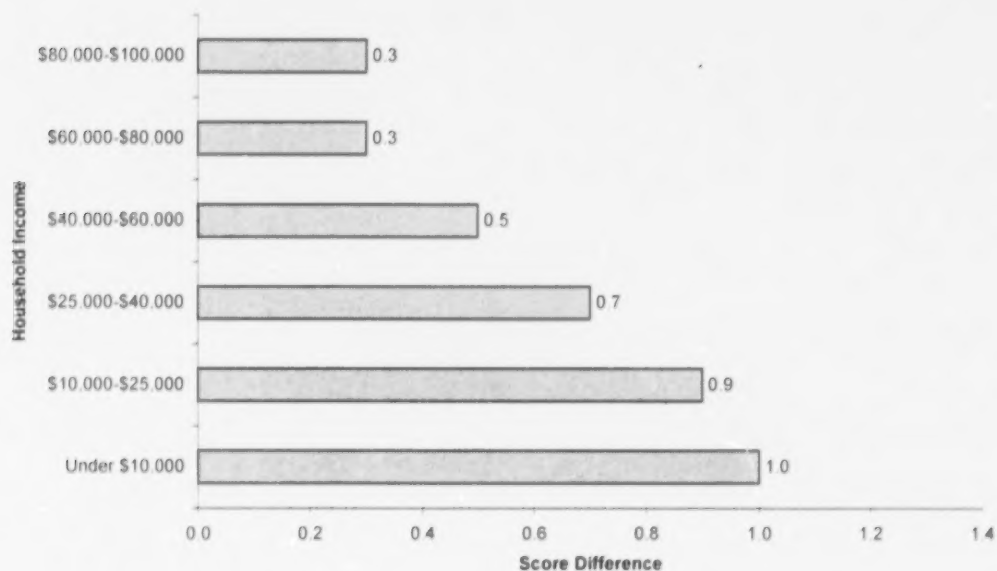


Figure 49
AP Biology
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

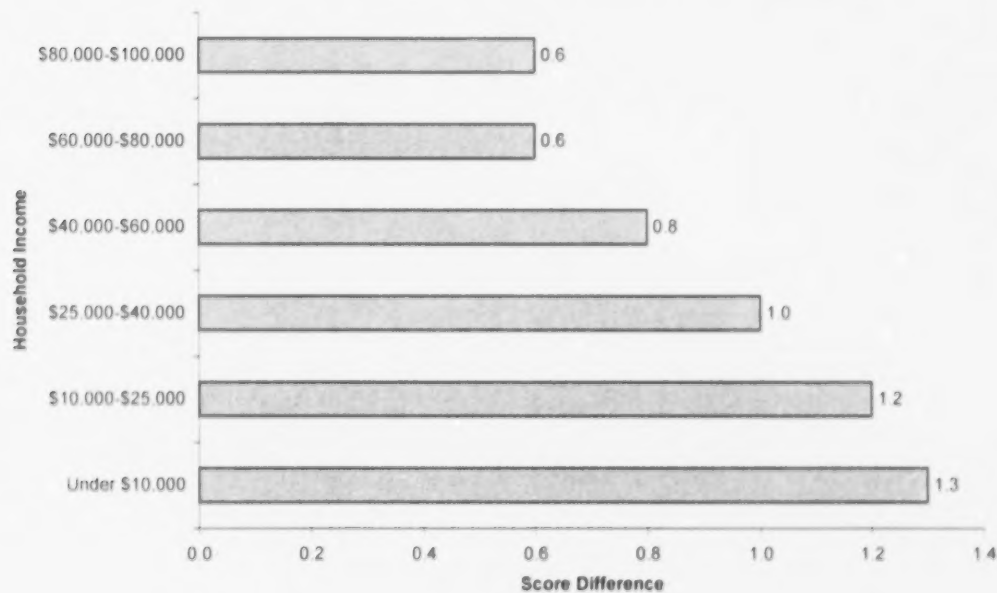


Figure 50
AP Calculus AB
GCS Mean Scores by Household Income

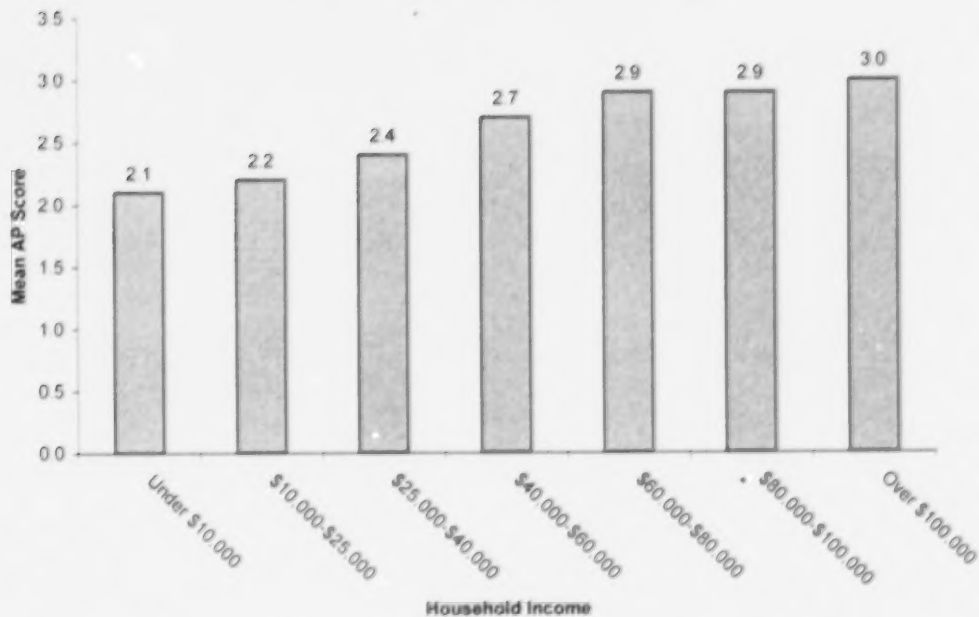


Figure 51
AP Calculus AB
National Mean Scores by Household Income

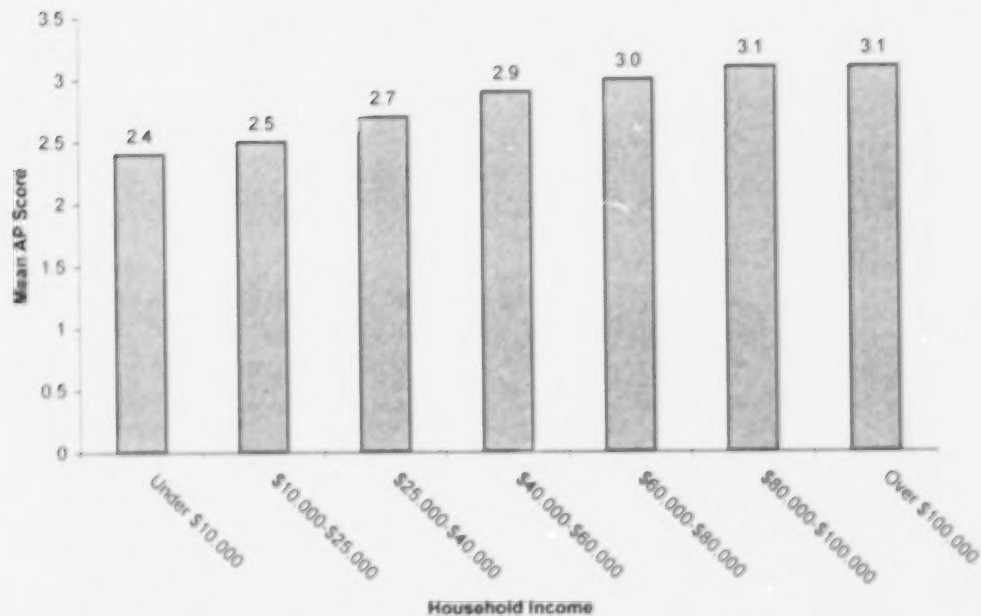


Figure 52
AP Calculus AB
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

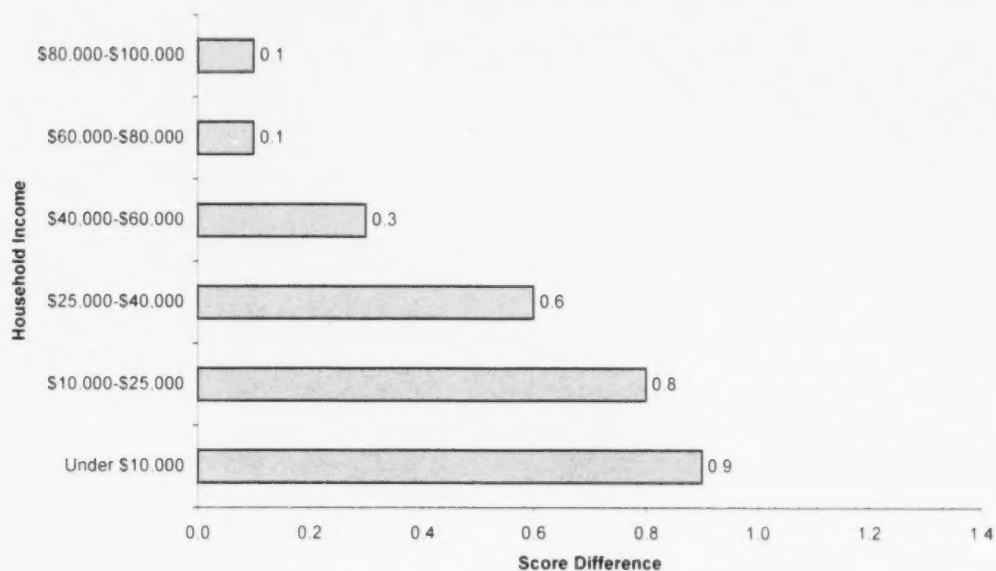


Figure 53
AP Calculus AB
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

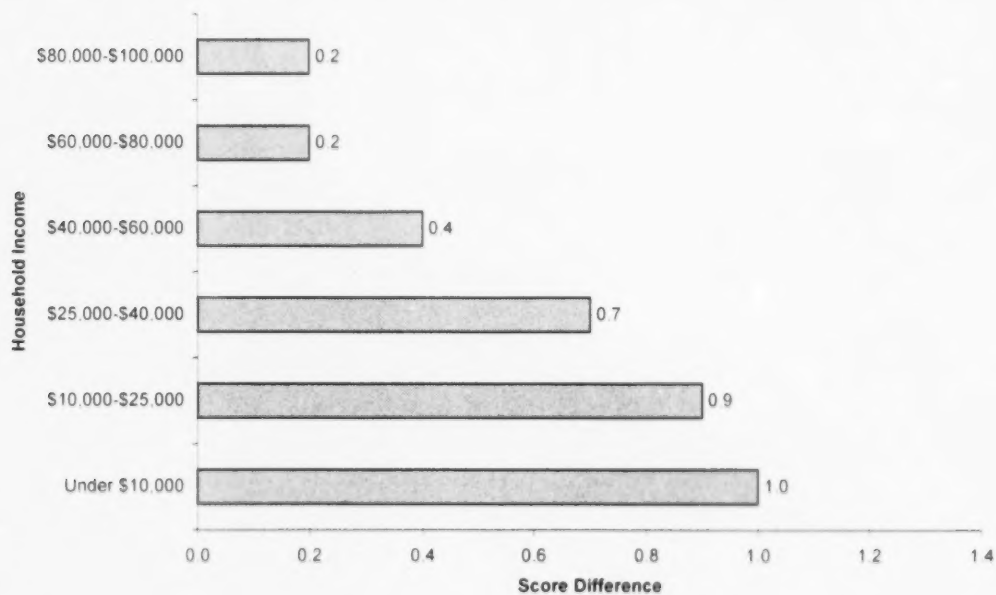


Figure 54
AP Chemistry
GCS Mean Scores by Household Income

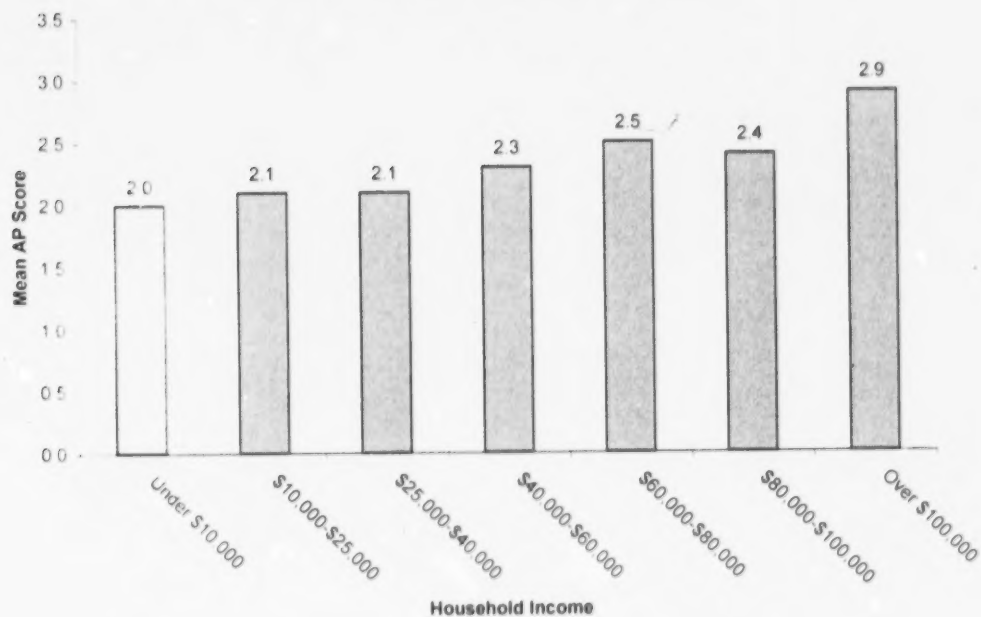


Figure 55
AP Chemistry
National Mean Scores by Household Income

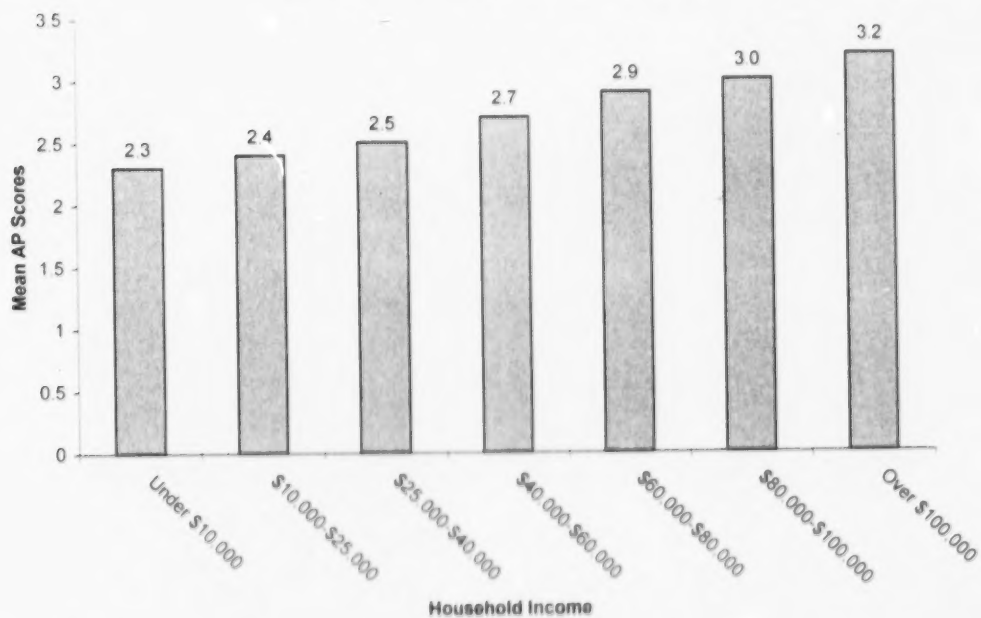


Figure 56
AP Chemistry
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

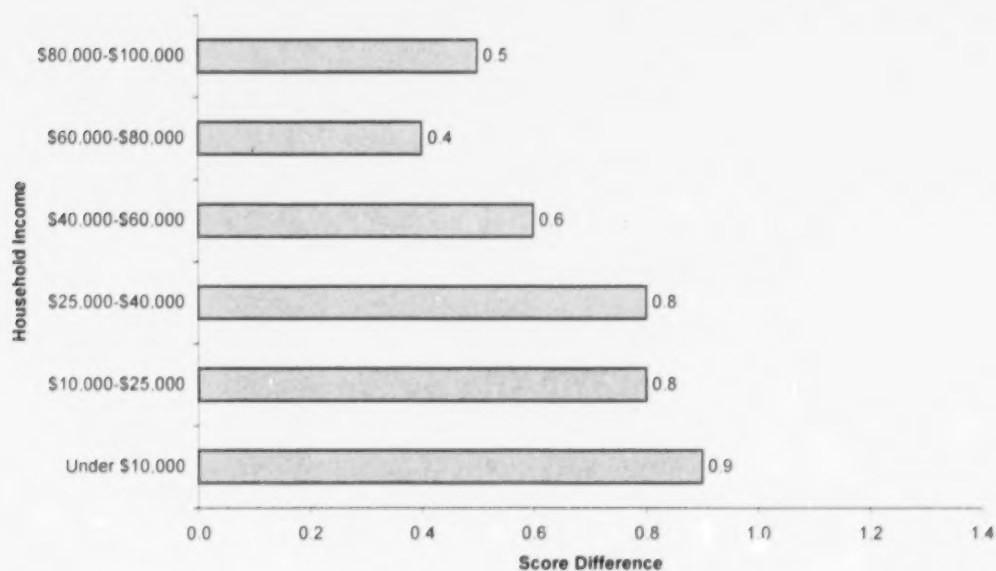


Figure 57
AP Chemistry
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

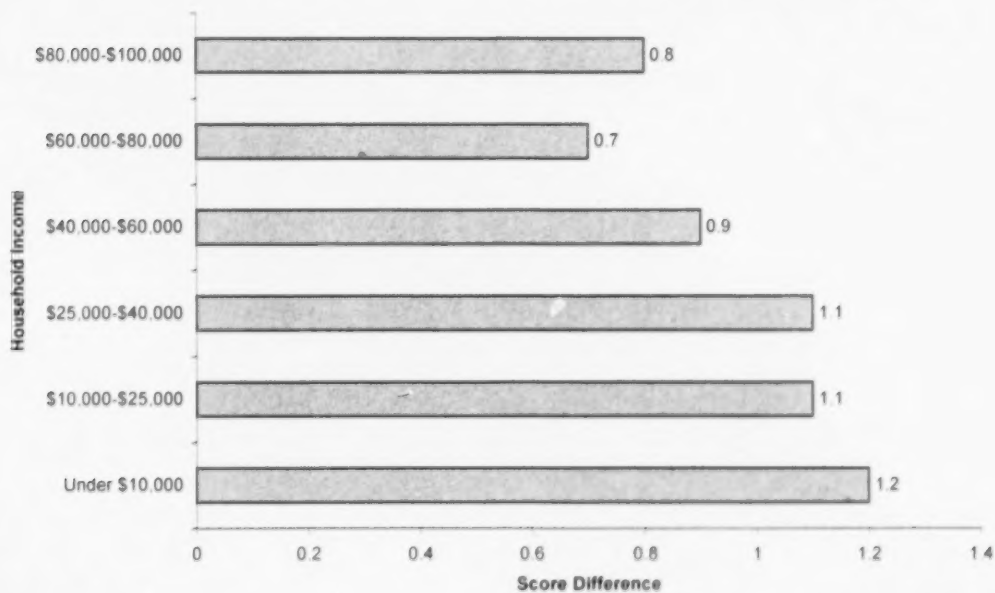


Figure 58
AP English Language
GCS Mean Scores by Household Income

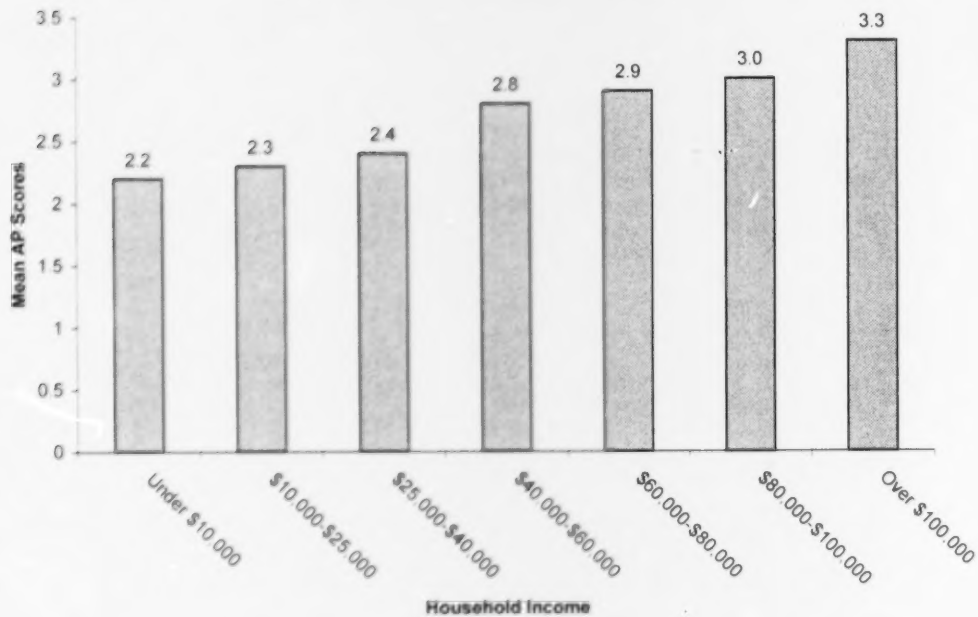


Figure 59
AP English Language
National Mean Scores by Household Income

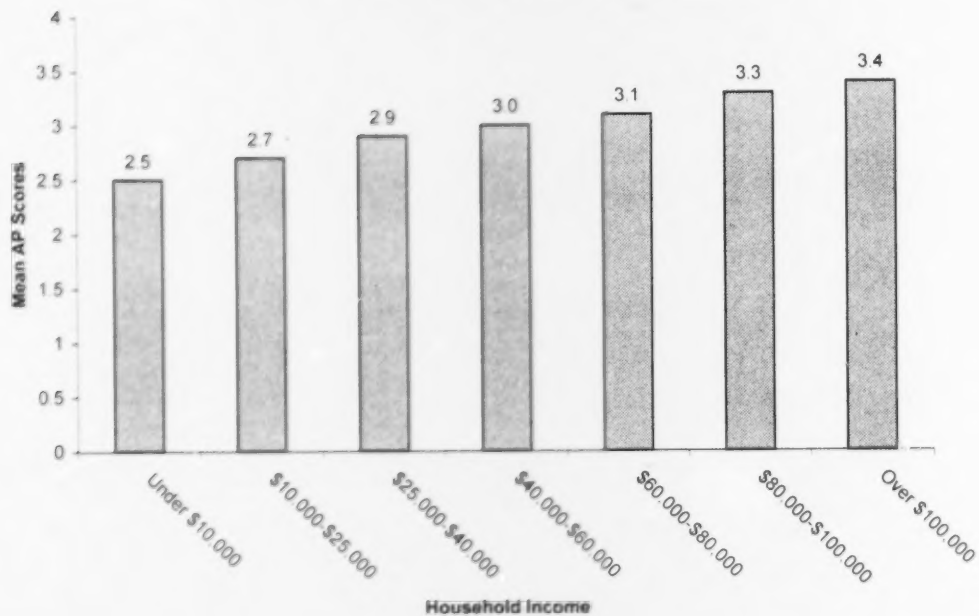


Figure 60
AP English Language
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

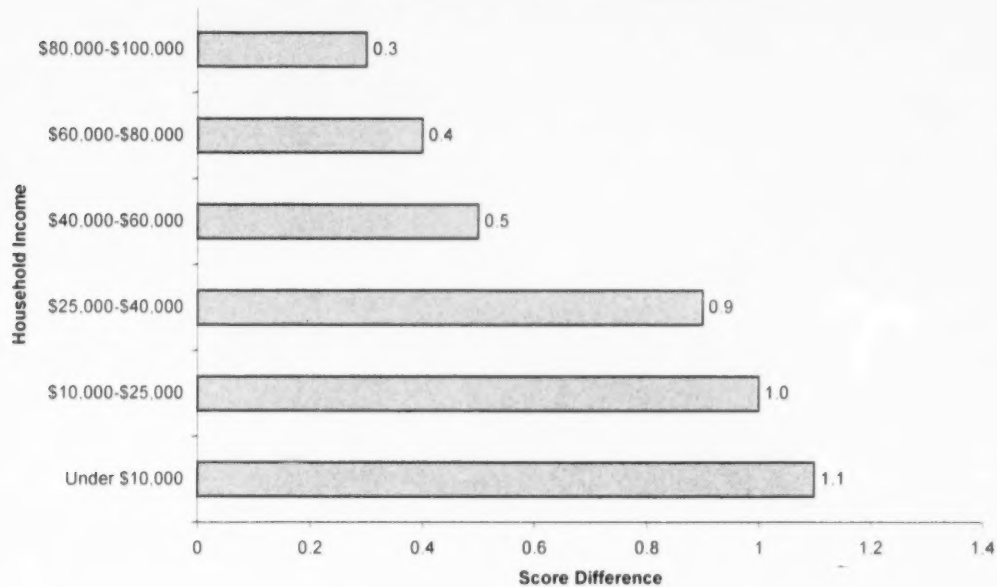


Figure 61
AP English Language
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

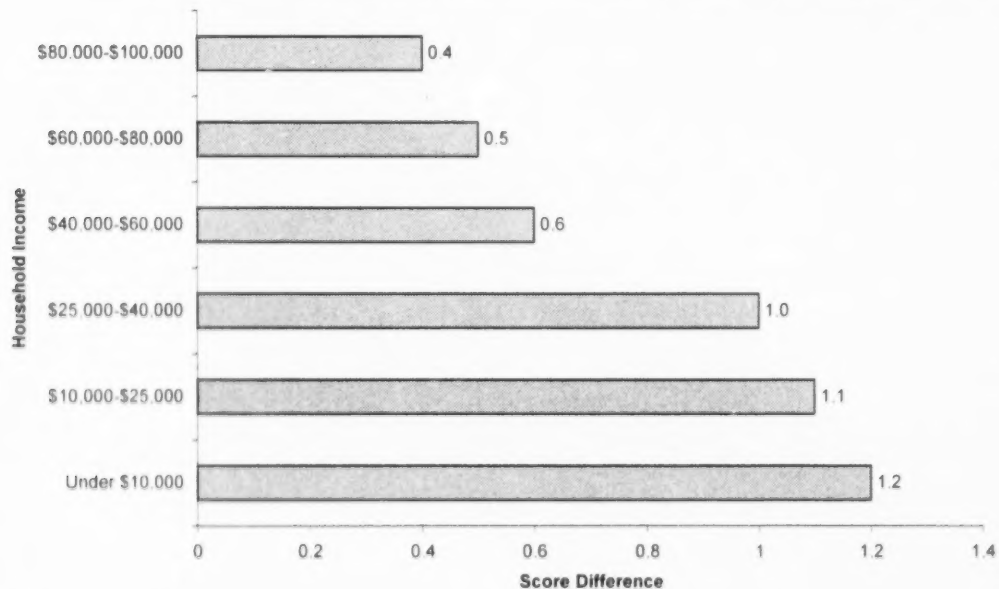


Figure 62
AP English Literature
GCS Mean Scores by Household Income

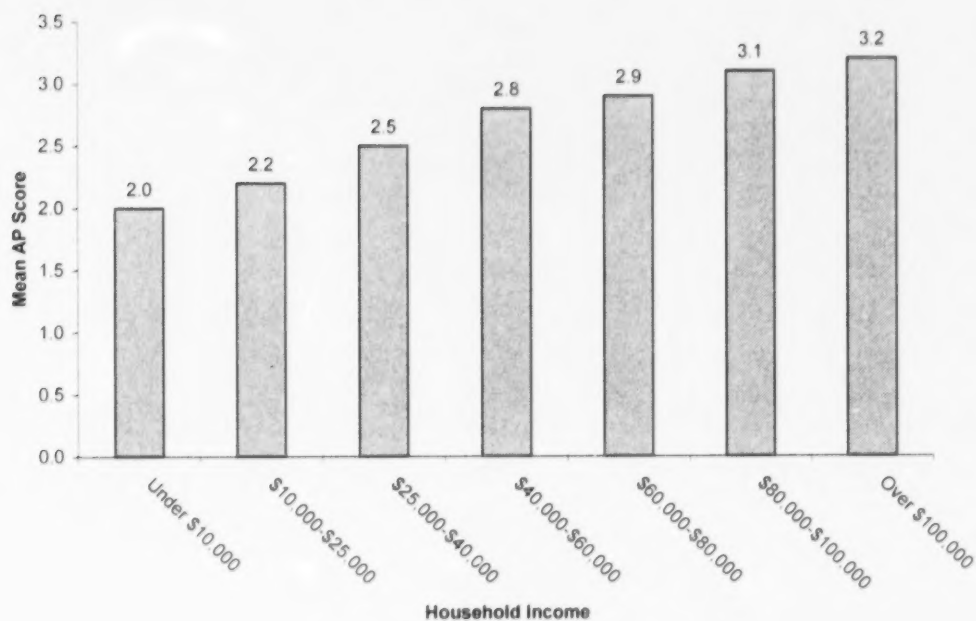


Figure 63
AP English Literature
National Mean Scores by Household Income

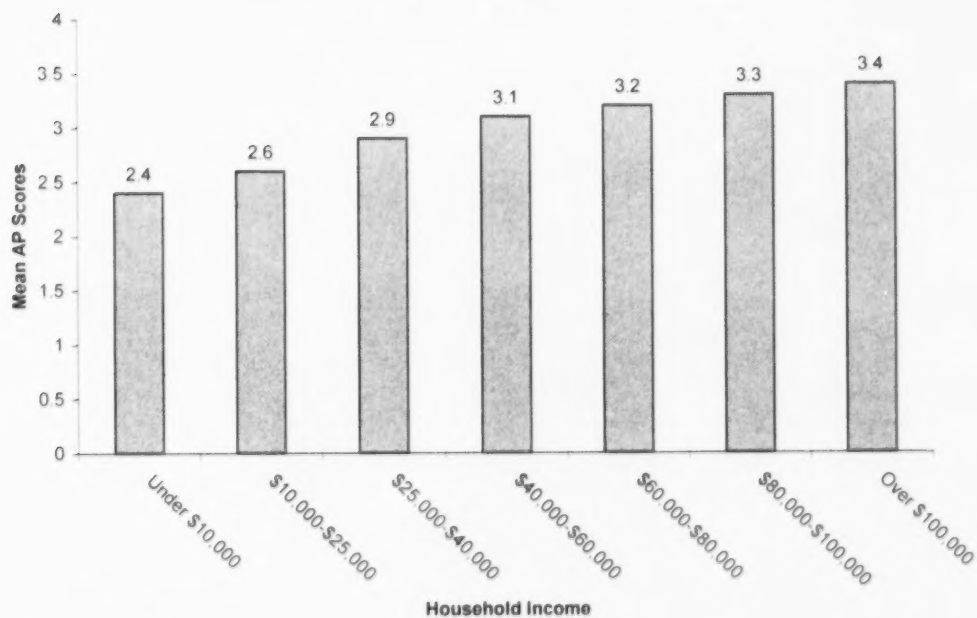


Figure 64
AP English Literature
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

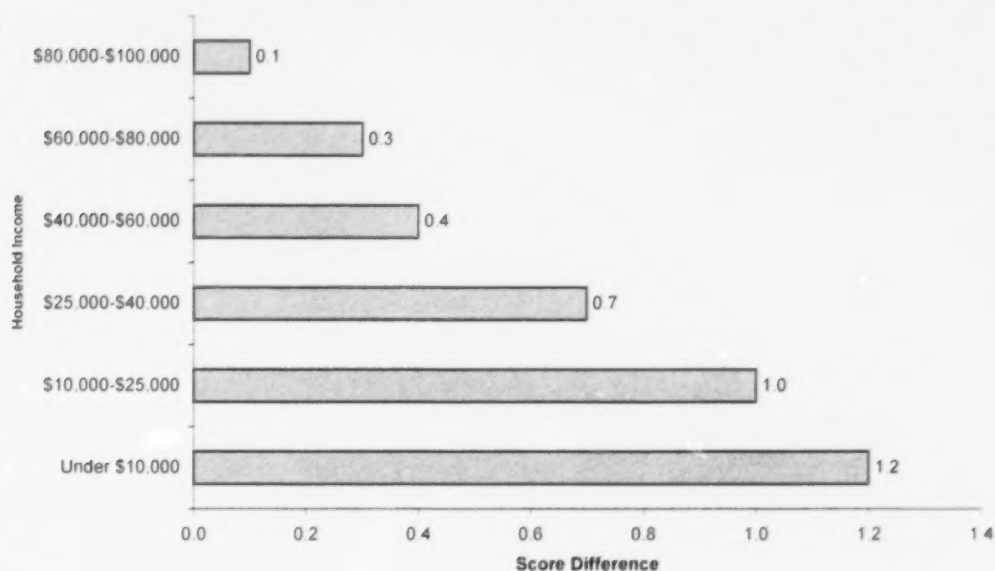


Figure 65
AP English Literature
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

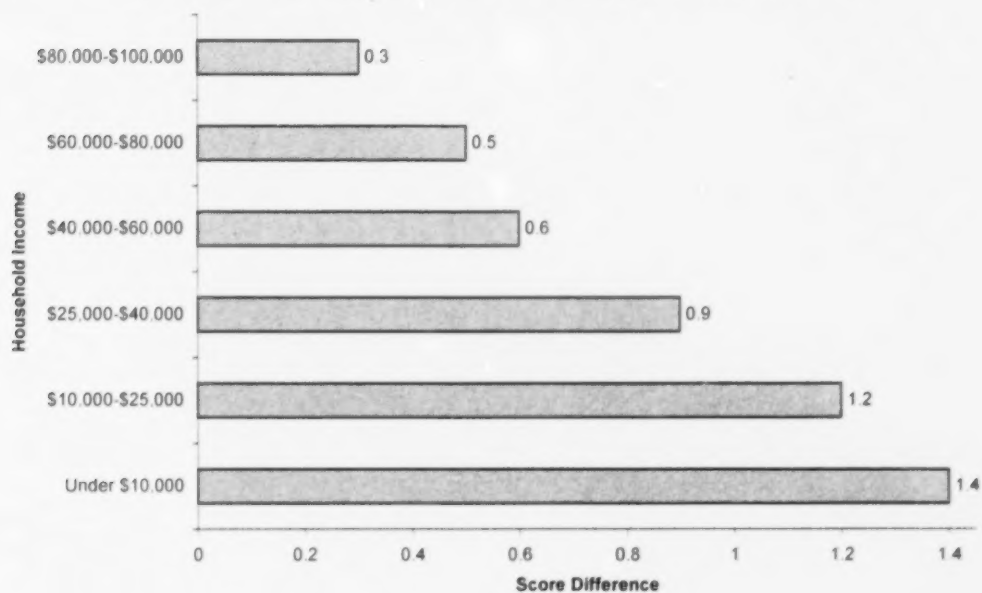


Figure 66
AP Physics B
GCS Mean Scores by Household Income

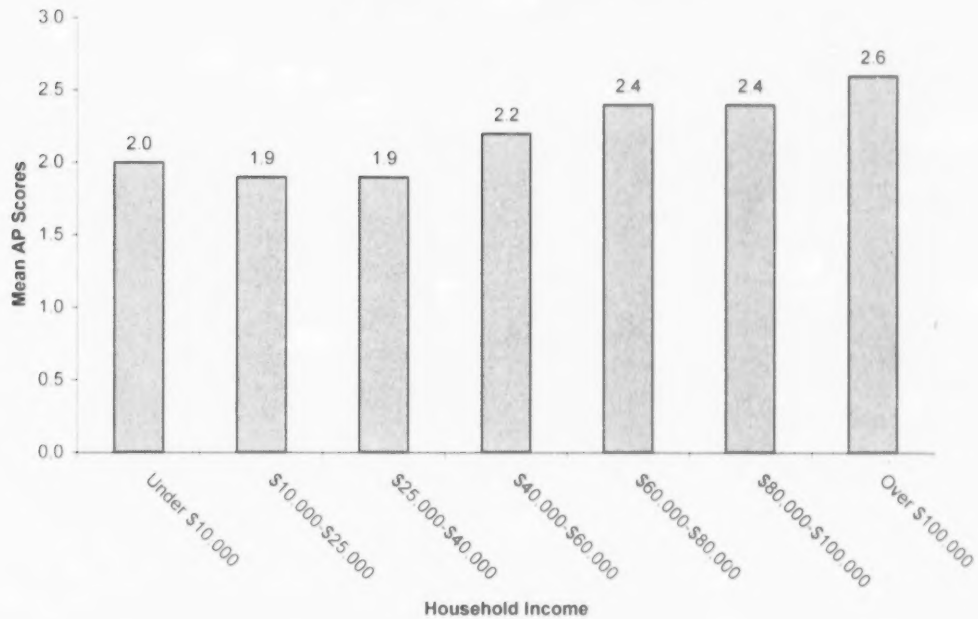


Figure 67
AP Physics B
National Mean Scores by Household Income

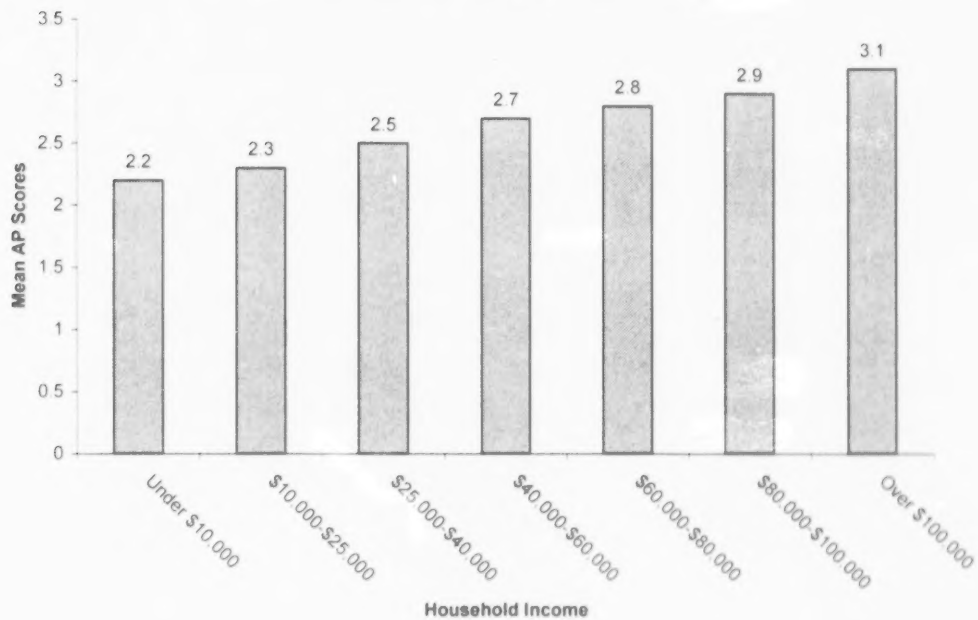


Figure 68
AP Physics B
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

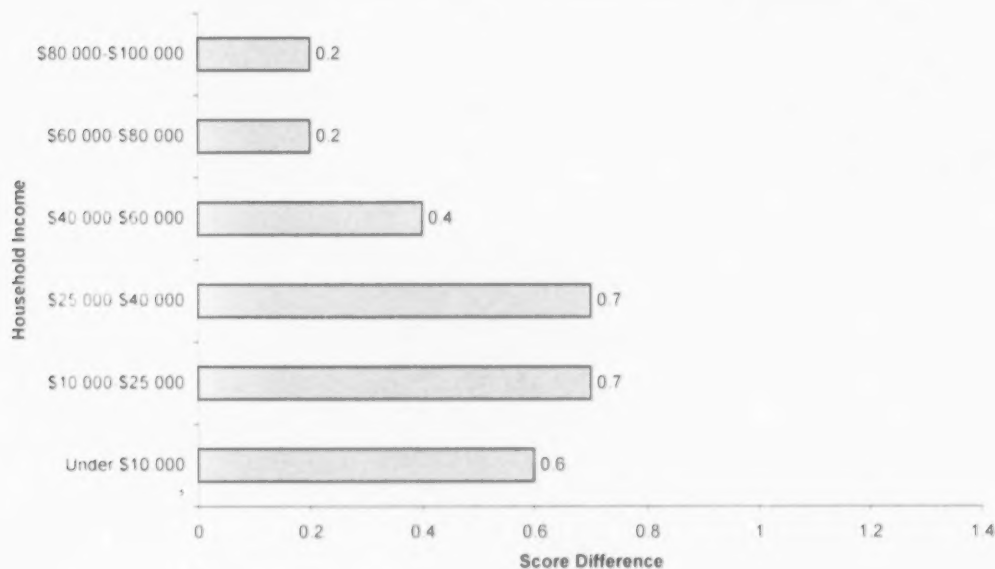


Figure 69
AP Physics B
Difference in Mean Score between the Nation's Students with Household Incomes
over \$100,000 and all other GCS Students, by Household Income

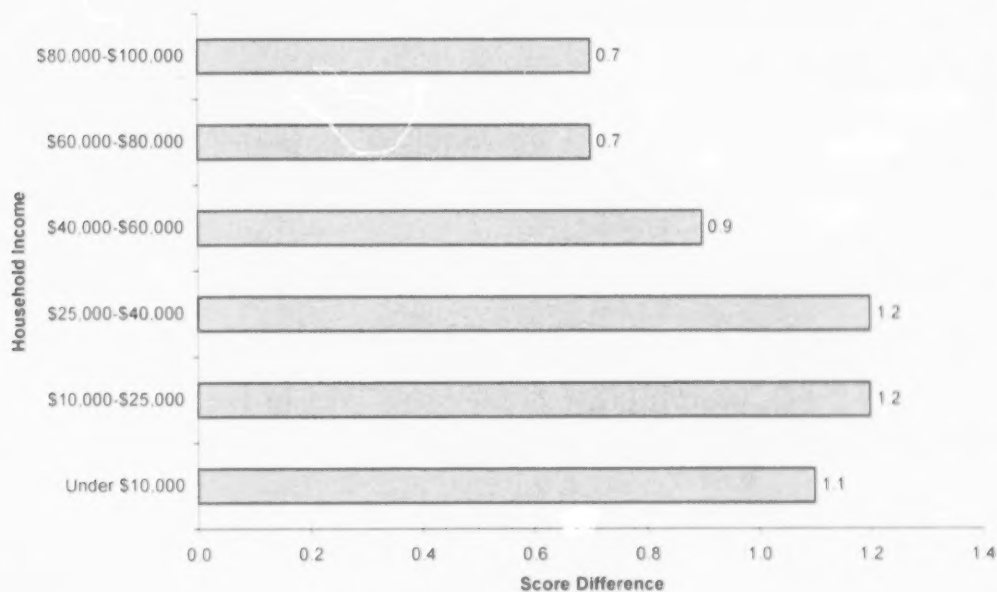


Figure 70
AP US History
GCS Mean Scores by Household Income

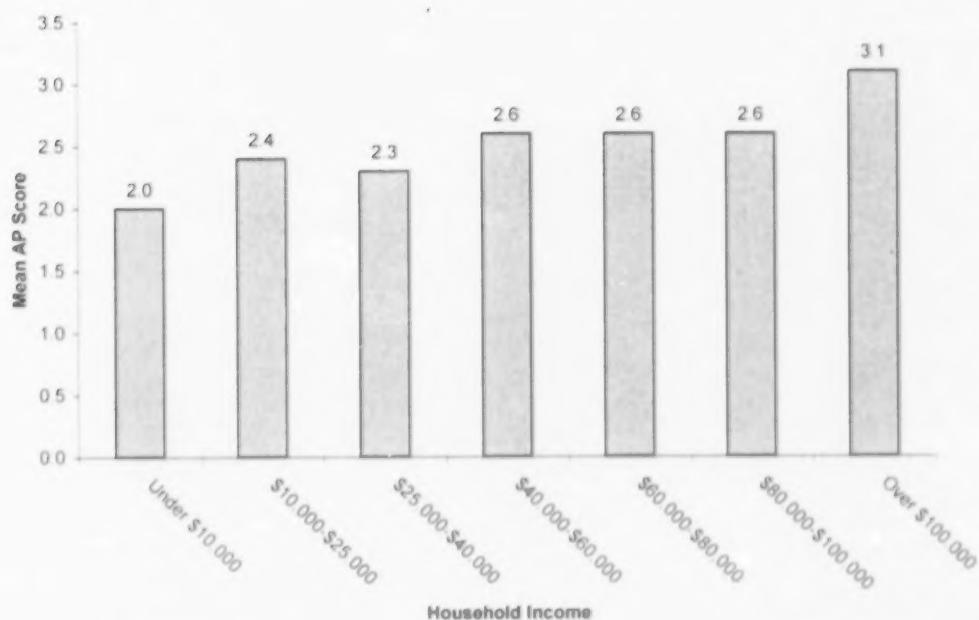


Figure 71
AP US History
National Mean Scores by Household Income

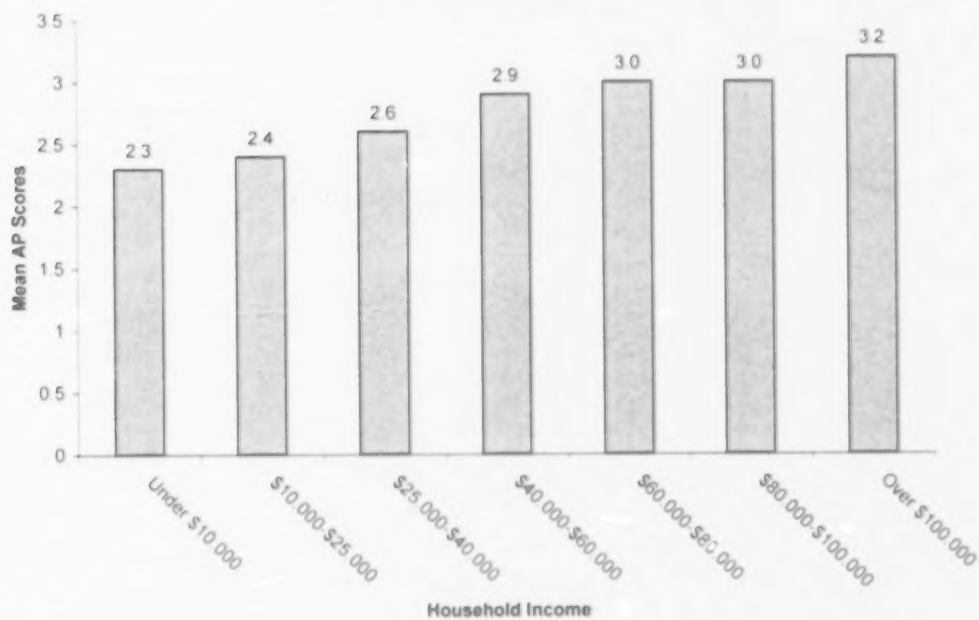


Figure 72
AP US History
Difference in Mean Score between GCS Students with Household Incomes over \$100,000
and all other GCS Students, by Household Income

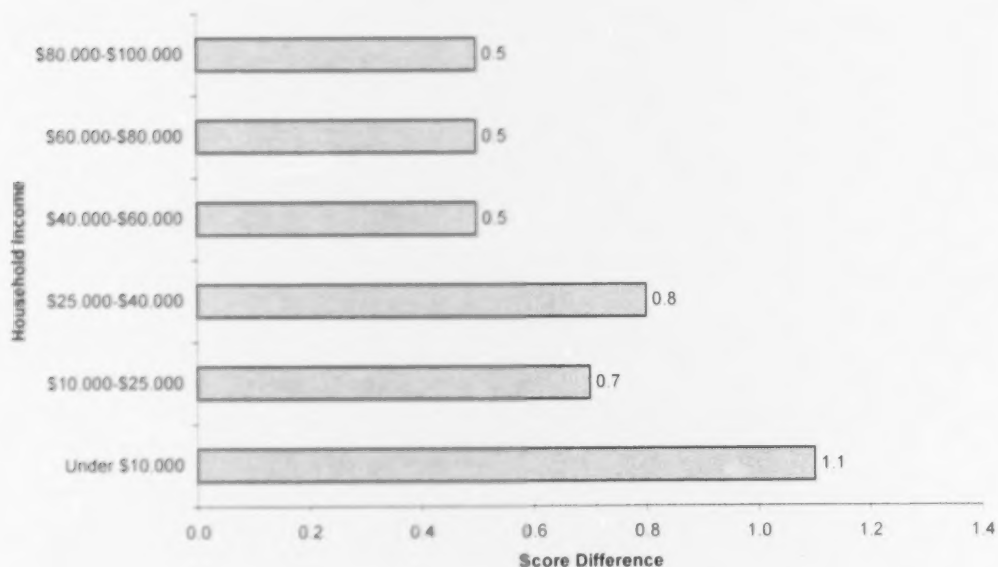
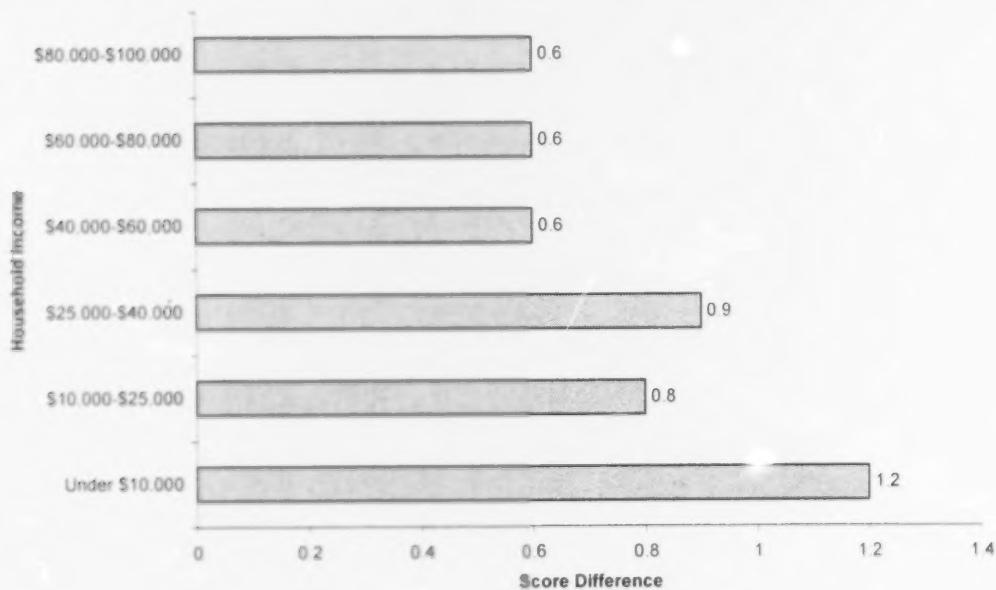


Figure 73
AP US History
Difference in Mean Score between the Nation's Students with Household Incomes over
\$100,000 and all other GCS Students, by Household Income



APPENDIX A

DESCRIPTION OF ADVANCED PLACEMENT SUBJECT TESTS

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DESCRIPTION OF ADVANCED PLACEMENT SUBJECT TESTS

Biology

The two main goals of AP Biology are to help students develop a conceptual framework for modern biology and to help students gain an appreciation of science as a process. Primary emphasis in an Advanced Placement Biology course should be on developing an understanding of concepts rather than on memorizing terms and technical details. Essential to this conceptual understanding are the following: a grasp of science as a process rather than as an accumulation of facts; personal experience in scientific inquiry; recognition of unifying themes that integrate the major topics of biology; and application of biological knowledge and critical thinking to environmental and social concerns.

AP Biology Courses and exams cover the following areas:

- Molecules and Cells
- Heredity and Evolution
- Organisms and Populations

These three areas have been subdivided into major categories with percentage goals for each major category specified. The percentage goals should serve as a guide for designing an AP Biology course and may be used to apportion the time devoted to each category. The examination is constructed using the percentage goals as guidelines for question distribution.

Calculus AB and Calculus BC

Calculus AB can be offered by any school with a curriculum that includes all of the prerequisites for a year's course in calculus. Calculus AB is designed to be taught over a full high school academic year. It is possible to spend some time on elementary functions and still cover the Calculus AB curriculum within a year. However, if students are to be adequately prepared for the Calculus AB examination, most of the year must be devoted to topics in differential and integral calculus. These topics are the focus of the AP Examination questions.

Calculus BC can be offered by schools that are able to complete all the prerequisites before the course. Calculus BC is a full-year course in the calculus of functions of a single variable. It includes all topics covered in Calculus AB plus additional topics. Both courses are intended to be equally challenging and demanding, and they require a similar depth of understanding of common topics.

Chemistry

AP Chemistry should meet the objectives of a good general chemistry course. Students should attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course should contribute to the development of the students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic. The college course in general chemistry differs qualitatively from the usual first secondary school course in chemistry with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and the mathematical formulation of principles, and the kind of laboratory work done by students. Quantitative differences appear in the number of topics treated, the time spent on the course by students, and the nature and the variety of experiments done in the laboratory. Secondary schools that wish to offer an AP Chemistry course must be prepared to provide a laboratory experience equivalent to that of a typical college course.

The AP Chemistry course is designed to be taken only after the successful completion of a first course in high school chemistry. It is strongly recommended that credit in a first-year high school chemistry course be a prerequisite for enrollment in an AP Chemistry class. In addition, the recommended mathematics prerequisite for an AP Chemistry class is the successful completion of a second-year algebra course. The advanced work in chemistry should not displace any other part of the student's science curriculum. A student have a course in secondary school physics and a four-year college preparatory program in mathematics.

Computer Science A and Computer Science AB

Computer Science A emphasizes programming methodology with an emphasis on problem solving and algorithm development and is meant to be the equivalent of a first-semester course in computer science. It also includes the study of data structures and abstraction, but these topics are not covered to the extent that they are covered in Computer Science AB.

Computer Science AB includes all the topics of Computer Science A, as well as a more formal and a more in-depth study of algorithms, data structures, and data abstraction. For example, binary trees are studied in Computer Science AB but not in Computer Science A. The use of recursive data structures and dynamically allocated structures is fundamental to Computer Science AB.

English Language and Composition

The AP English Language and Composition course is designed to help students become skilled readers of prose written in a variety of periods, disciplines, and rhetorical contexts and to become skilled writers who can compose for a variety of purposes. By their writing and reading in this course, students should become aware of the interactions among a writer's purposes, audience expectations, and subjects, as well as the way generic conventions and the resources of language contribute to effective writing.

The college composition course that the AP Language and Composition course is intended to parallel is one of the most varied in the curriculum. The college course often allows students to write in a variety of forms - narrative, exploratory, expository, argumentative - and on a variety of subjects from personal experiences to public policies, from imaginative literature to popular culture. But the main objective in most first-year writing courses is to enable students to write effectively and confidently in all their college courses and in their professional and personal lives. Therefore, most composition courses emphasize the expository, analytical, and argumentative writing that forms the basis of academic and professional communication, as well as the personal and reflective writing that fosters the ability to write in any context. As in the college course, the purpose of the AP Language and Composition course is to enable students to read complex texts with understanding and to write prose that is rich enough and complex enough for mature readers.

English Literature and Composition

The AP English Literature and Composition course is designed to engage students in the careful reading and critical analysis of imaginative literature. Through the close reading of selected texts, students can deepen their understanding of the ways writers use language to provide both meaning and pleasure for their readers. As they read, students should consider a work's structure, style, and themes, as well as such smaller-scale elements as the use of figurative language, imagery, symbolism, and tone.

The course should include intensive study of representative works from various genres and periods, concentrating on works of recognized literary merit. The works chosen should invite and gratify rereading. Students should read works from several genres and periods - from the sixteenth to the twentieth century - but, more importantly, they should get to know a few works well. They should read deliberately and thoroughly, taking time to understand a work's complexity, to absorb its richness of meaning, and to analyze how that meaning is embodied in literary form. In addition to considering a work's literary artistry, students should consider the social and historical values it reflects and embodies. Careful attention to both textual detail and historical context should provide a foundation for interpretation, whatever critical perspectives are brought to bear on the literary works studied.

Writing should be an integral part of the AP English Literature and Composition course, for the AP Examination is weighted toward student writing about literature. Writing assignments should focus on the critical analysis of literature and should include expository, analytical, and argumentative essays. Although critical analysis should make up the bulk of student writing for the course, well-constructed creative writing assignments may help students see from the inside how literature is written. The goal of both types of writing assignments is to

Advanced Placement Examinations in the Great City Schools

increase students' ability to explain clearly, cogently, even elegantly, what they understand about literary works and why they interpret them as they do.

Physics B and Physics C

The Physics B course includes topics in both classical and modern physics. A knowledge of algebra and basic trigonometry is required for the course; the basic ideas of calculus may be introduced in the theoretical development of some physical concepts, such as acceleration and work. Understanding of the basic principles involved and the ability to apply these principles in the solution of problems should be the major goals of the course.

The course seeks to be representative of topics covered in similar college courses, as determined by periodic surveys. Accordingly, goals have been set for percentage coverage of five general areas:

- Newtonian Mechanics (35%)
- Thermal Physics (10%)
- Electricity and Magnetism (25%)
- Waves and Optics (15%)
- Atomic and Nuclear Physics (15%)

The Physics C course ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. The sequence is more intensive and analytic than that in the B course. Strong emphasis is placed on solving a variety of challenging problems, some requiring calculus. The subject matter of the C course is principally mechanics, and electricity and magnetism, with approximately equal emphasis on these two areas. The C course is the first part of a sequence which in college is sometimes a very intensive one-year course but often extends over one and one-half to two years, with a laboratory component.

In the typical C course, roughly one-half year is devoted to mechanics. Use of calculus in problem solving and in derivations is expected to increase as the course progresses. In the second half-year of the C course, the primary emphasis is on classical electricity and magnetism. Calculus is used freely in formulating principles and in solving problems.

The Physics C examination consists of two parts, each one and one-half hours long. One part covers mechanics; the other part, electricity and magnetism. A student may take either or both parts, and a separate grade is reported for each.

United States History

The AP program in United States History is designed to provide students with the analytic skills and factual knowledge necessary to deal critically with the problems and materials in US history. Students should learn to assess historical materials—their relevance to a given interpretive problem, their reliability, and their importance—and to weigh the evidence and interpretations presented in historical scholarship. Striking a balance between factual knowledge and critical analysis is a crucial task in preparing students for the AP examination.

*Source: The College Board Website

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APPENDIX B

ADVANCED PLACEMENT EXAMINATION SCORING LEVELS AND COLLEGE CREDIT

ADVANCED PLACEMENT EXAMINATION SCORING LEVELS AND COLLEGE CREDIT

The end product of the AP Exams are the AP grades that are reported to candidates, their schools, and their designated colleges. AP grades range from 5 to 1:

- 5 – Extremely Well Qualified
- 4 – Well Qualified
- 3 – Qualified
- 2 – Possibly Qualified
- 1 – No recommendation

As a general rule the American Council on Education (ACE) recommends that colleges and universities award credit for AP grades of 3 or better on any AP examination. ACE further notes that the practice of granting provisional credit for a grade of 2 is becoming more frequent because comparability studies have shown that many of these students are possibly qualified. The credit is made permanent if the student satisfies another criterion, such as successfully completing the next course in the discipline.

The ACE recommended minimum number of semester hours corresponds to the status of the corresponding AP course: ACE recommends 3 semester hours in the case of a half-year course; 6 semester hours for most full-year courses; and 8 semester hours for some of the mathematics, sciences, and foreign language courses.

<u>AP Course/Exam</u>	<u>Recommended Semester Hours</u>
Biology	8
Calculus AB	3-4
Calculus BC	6-8
Chemistry	8
Computer Science A	3-4
Computer Science AB	6-8
English Language	6
English Literature	6
Physics B	6-8
Physics C (Mechanics)	4
Physics C (Electricity & Mechanics)	4
US History	6

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APPENDIX C

DEFINITION OF "CORE" AND "LESS THAN CORE" ACADEMIC PREPARATION

DEFINITION OF "CORE" AND "LESS THAN CORE" ACADEMIC PREPARATION

Adequate high school course preparation, or "core" academic preparation, is defined as the courses in each content area that many college admissions officers use to determine proper academic preparation for an incoming first-year college student. Those courses include:

- **English** (four years or more):

One year credit each for English 9, English 10, English 11, and English 12.

- **Mathematics** (three years or more):

One year credit each for Algebra 1, Algebra 2, and Geometry. One-half year credit each for Trigonometry, Calculus (not Pre-Calculus), other mathematics courses beyond Algebra 2, and Computer Mathematics/Computer Science.

- **Social Studies** (three years or more):

One year credit each for American History, World History, and American Government; one-half year credit each for Economics, Geography, Psychology, and other history (European, State, etc.).

- **Science Reasoning** (three years or more):

One year credit each for General/Physical/Earth Science, Biology, Chemistry, and Physics.

A "less than core" academic program is defined as any high school program consisting of fewer courses than those included in the core curriculum listed above.

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APPENDIX D

GREAT CITY SCHOOL DISTRICTS

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GREAT CITY SCHOOL DISTRICTS

The data in this report includes 1998 – 1999 AP test scores from the following school districts:

Akron Public Schools*	Mesa Unified School District*
Anchorage School District	Milwaukee Public Schools
Atlanta Public Schools	Minneapolis Public Schools
Baltimore City Public Schools	Nashville-Davidson Metropolitan Public Schools
Birmingham Public Schools	Newark Public Schools
Boston Public Schools	New Orleans Parish School Board
Broward County Public Schools	New York City Board of Education
Buffalo Public Schools	Norfolk Public Schools
Charlotte-Mecklenberg Public Schools	Oakland Unified School District
Chicago Public Schools	Oklahoma City Public Schools*
Clark County Public Schools (Las Vegas, NV)	Omaha Public Schools
Cleveland Public Schools	Orange County Public Schools (Orlando, FL)
Columbus Public Schools	Philadelphia School District
Dade County Public Schools (Miami, FL)	Pittsburgh Public Schools
Dallas Independent School District	Portland Public Schools
Dayton Public Schools	Providence Public Schools
Denver Public Schools	Richmond Public Schools
Des Moines Independent School District	Rochester City School District
Detroit Public Schools	Sacramento Unified School District
District of Columbia Public Schools	Salt Lake City School District
El Paso Independent School District*	San Antonio Independent School District*
Fort Worth Independent School District	San Diego Unified School District
Fresno Unified School District	San Francisco Unified School District
Houston Independent School District	Seattle Public Schools
Indianapolis Public Schools	St. Louis Public Schools
Jefferson County Public Schools (Louisville, KY)	St. Paul Public Schools
Long Beach Unified School District	Toledo Public Schools
Los Angeles Unified School District	Tucson Unified School District
Memphis City Public Schools	Tulsa Public Schools

*At the time of publication these districts were not members of the Council of the Great City Schools.

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ABOUT THE ORGANIZATIONS

The **Council of the Great City Schools** is the only independent organization in the nation whose sole purpose is improving urban public education. Composed of 56 of the nation's largest city public school districts, the Council promotes urban education and is an advocate for urban students through legislation, research, and media relations. The organization also provides forums for school districts to share common problems and solutions, exchange information, and address new challenges.

The **College Board** is a national, nonprofit membership association dedicated to preparing, inspiring, and connecting students to colleges and opportunity. Founded in 1900, the association is composed of more than 3,800 schools, colleges, universities, and other educational organizations. Each year the College Board serves over three million students and their parents, 22,000 high schools, and 3,500 colleges through major programs and services in college admission, guidance, assessment, financial aid, enrollment, and teaching and learning. Among its best-known programs are the SAT, the PSAT/NMSQT, the Advanced Placement Program® (AP), and Pacesetter®.